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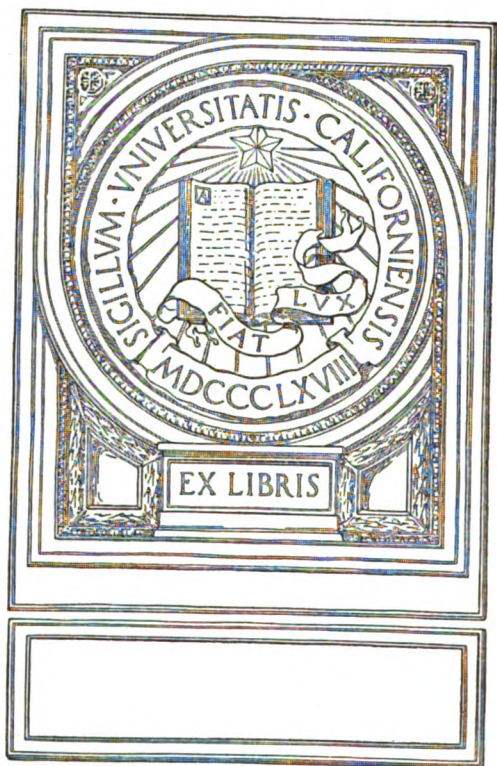
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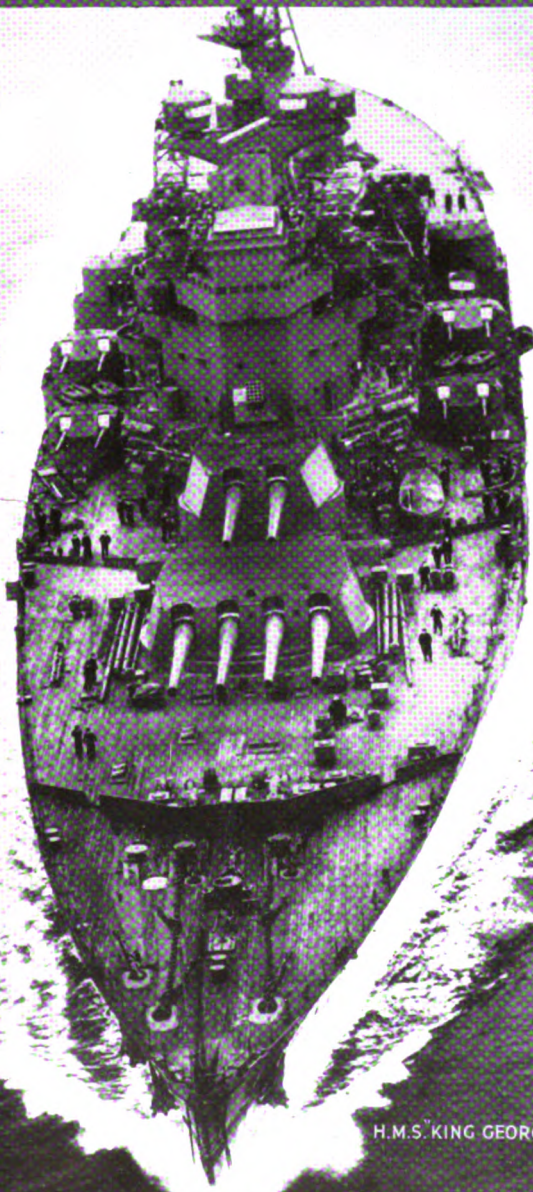
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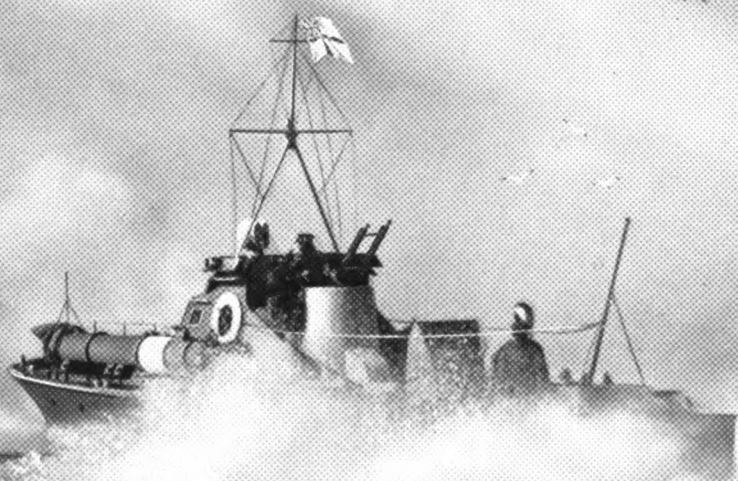


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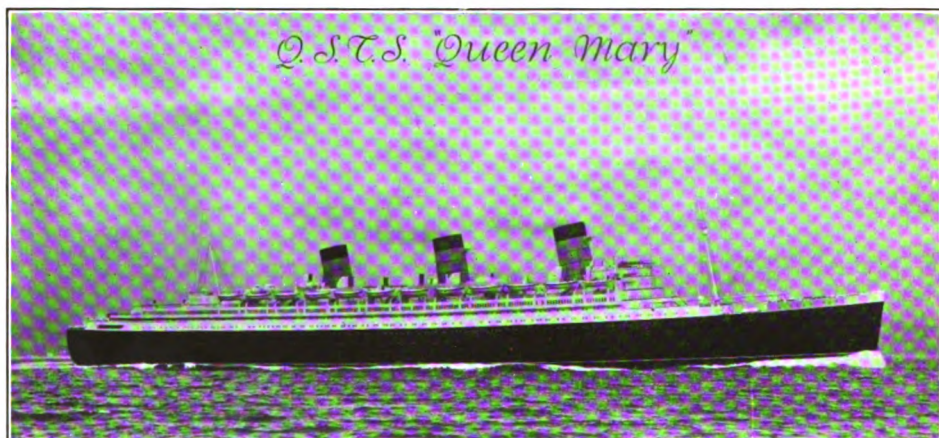
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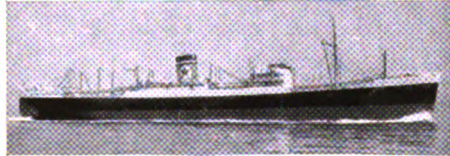
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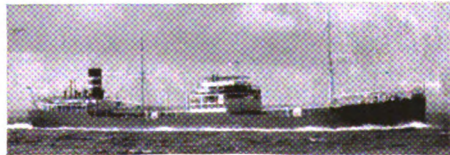
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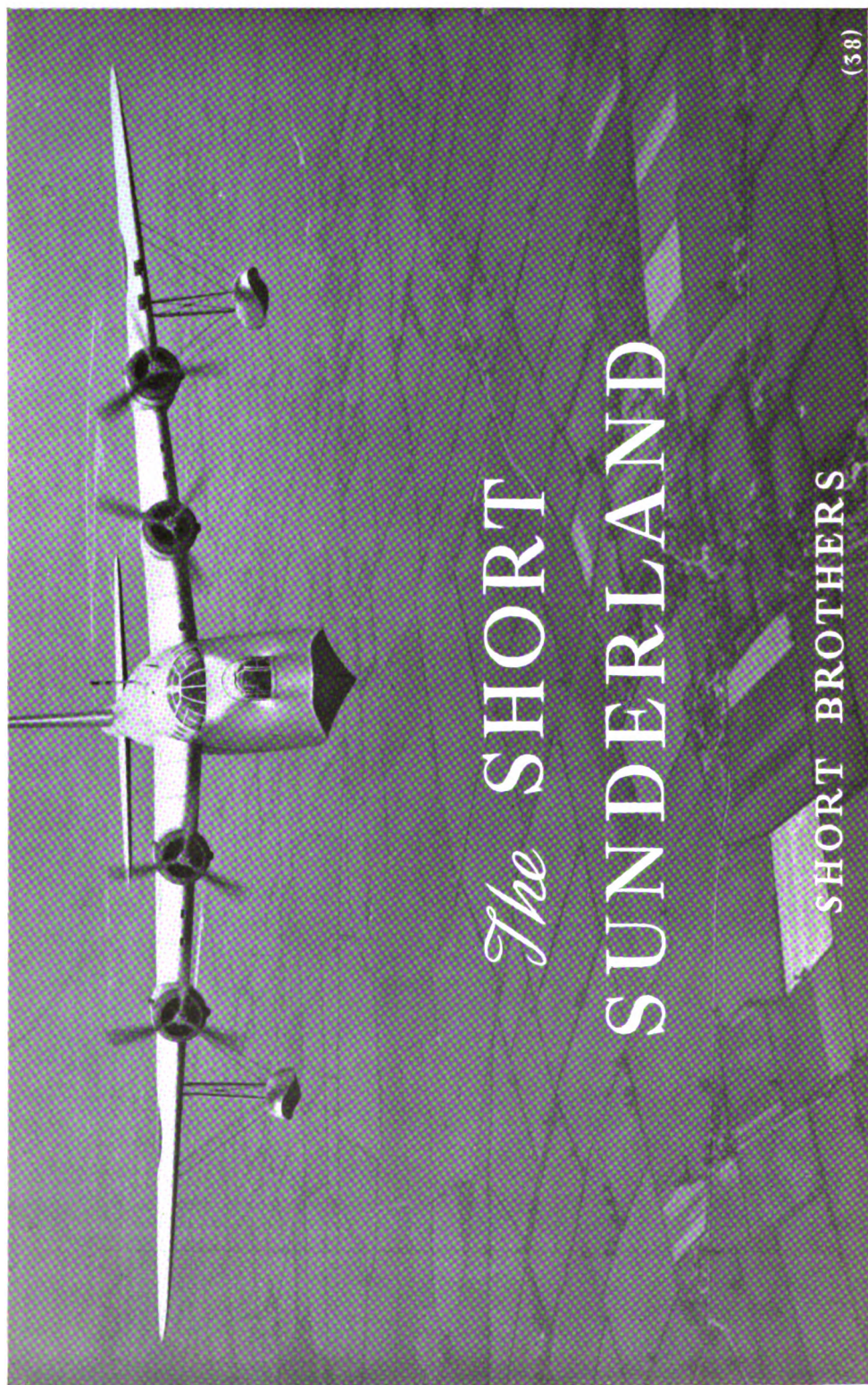
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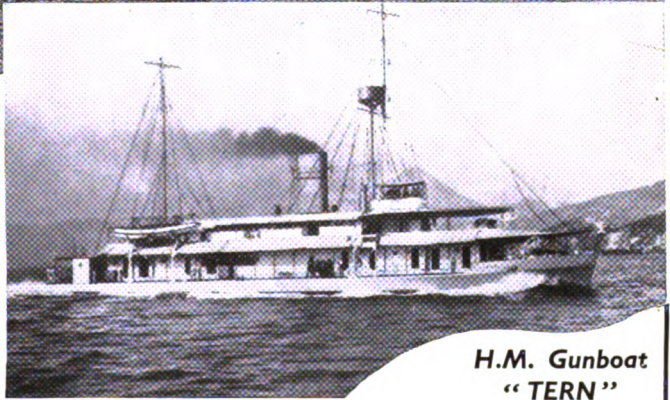
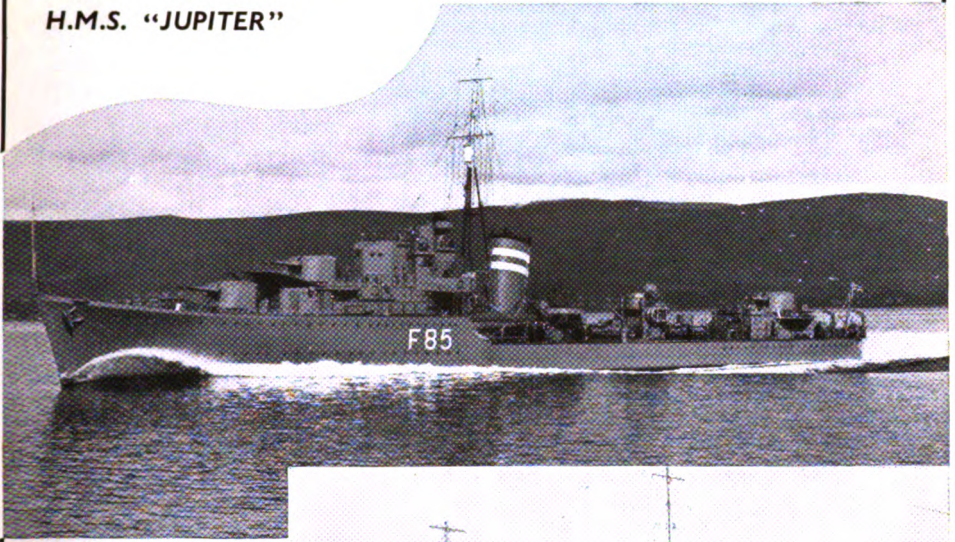


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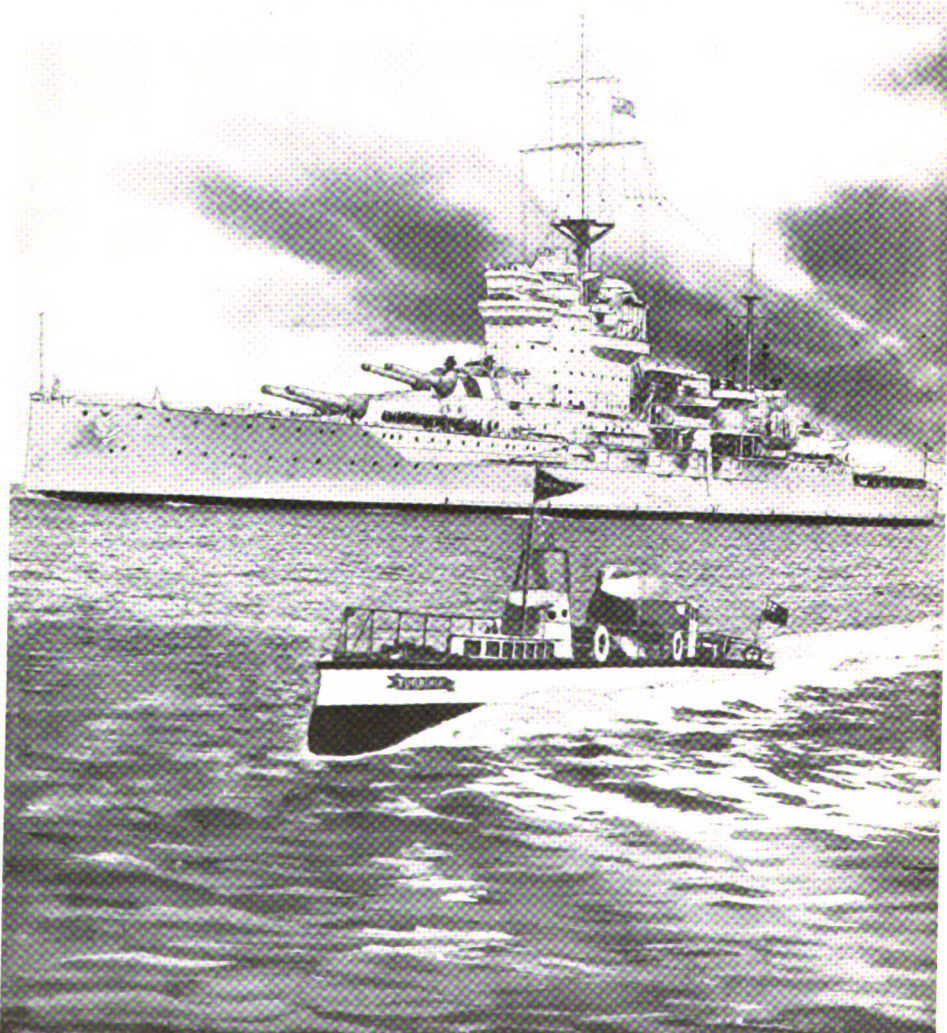
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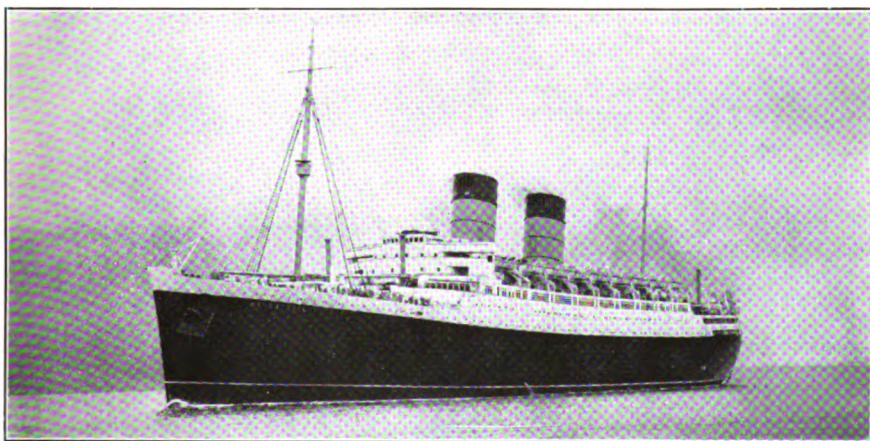
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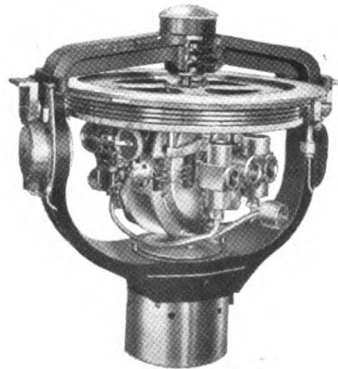
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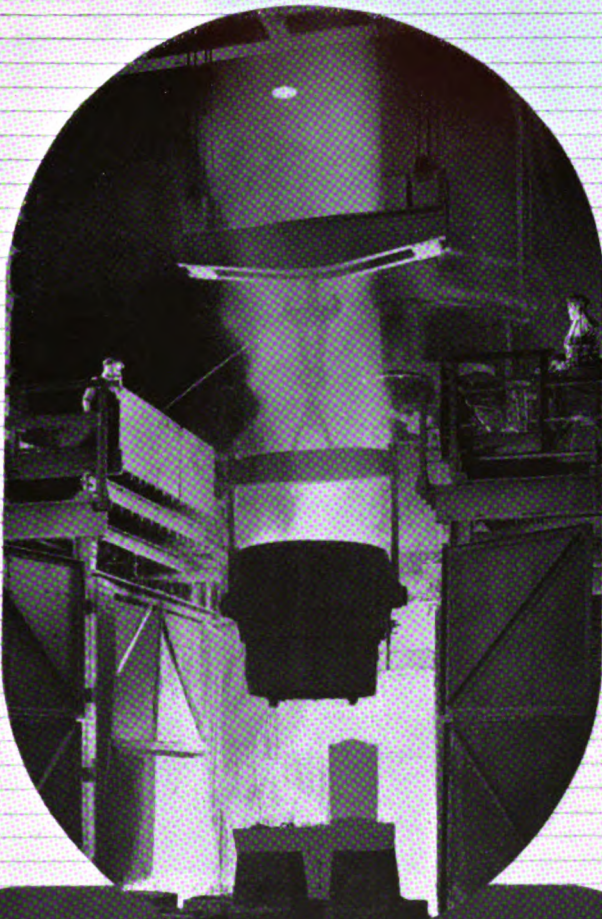
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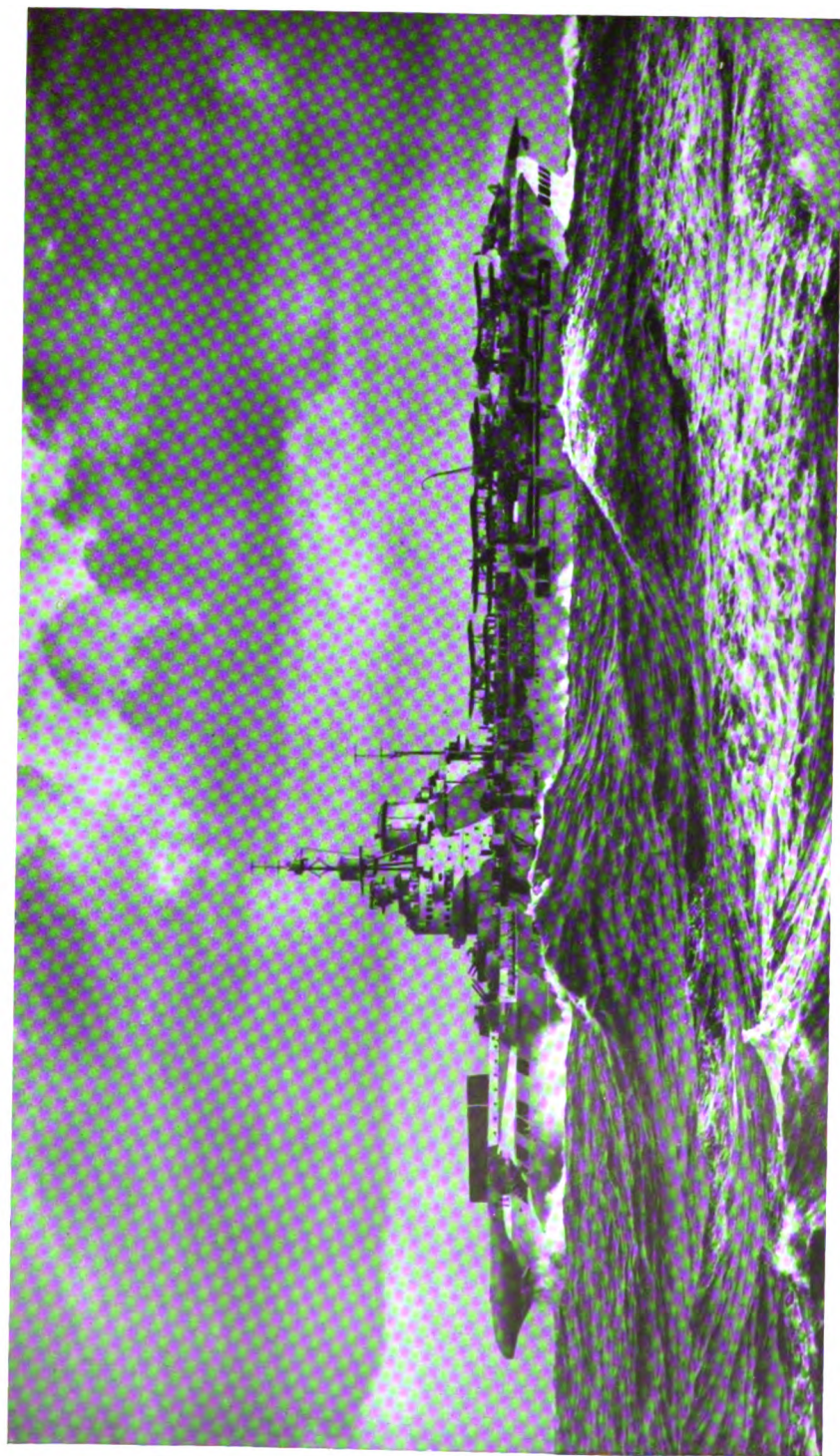
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PREFACE

ONCE again "Brassey" makes its appearance in war-time guise—a chronicle of the war at sea during 1941 and a commentary, from various points of view, on different aspects of it. The difference this year is that war-time difficulties of book production have delayed its appearance many weeks after the usual date of publication.

The course of the war as a whole is chronicled in Chapter I, Sir Archibald Hurd again reviews the Merchant Navy's part in the Battle of the Seas and Mr. McMurtrie the progress, so far as knowledge of it is allowed to become available, of Foreign Navies. Major Oliver Stewart again surveys the air operations that have played a part in the sea war and I would especially recommend to readers the conclusions he draws from that study and states in the concluding paragraphs of his chapter. His standpoint is naturally that of the air; Commander Pursey deals with part of the same subject, of air attacks on ships at sea and how they have developed in the whole course of the present war, from the point of view of the ship that has to meet and counter them.

The discussion of the influence of the air arm at sea—which under the British organisation is divided between two separate Services—naturally leads to the subject of inter-Service co-operation. Major Stewart touches on this aspect of his subject in the passages to which I have drawn attention; but I have also included an article by "Flag Officer" who approaches it from a somewhat different angle. The gallant author, who prefers to remain anonymous, is alone responsible for the presentation of his views and suggestions; but his experience has been such as to entitle them to no little weight. There can be few, if any, in this country who would disagree with his conviction of the paramount importance of securing the maximum degree of efficiency in the direction of our war effort and in the collaboration of the different arms; but views as to the best means of attaining those ends may well differ.

The chapter on the United States Navy is compiled this year exclusively from official documents and pronouncements. I have included in it a textual reproduction of the report of the Commission of Investigation into the circumstances of the Japanese attack on Pearl Harbour, as published in the American press at the time but not hitherto readily accessible *in extenso* in this country. It is a document which contains important lessons, not for our American allies alone, but for all those who are united in the fight against the Japanese aggressor. I have also included a study of the possibilities of the war in the Pacific by Mr. Alexander Kiralfy, a writer on the study of sea strategy who is very well known in the United States. This was written, and in my hands, before the war between the United States of America and Japan was anything more than a possibility, and it was in no sense a forecast of the probable course of events in that war, rather an exploration of possibilities. But it is noteworthy that,

though events in detail have taken a course markedly different from that which was envisaged, the broad outcome has been such as to confirm the essential soundness of Mr. Kiralfy's analysis.

Lastly, I have included the actual text of the Official Admiralty Report on the Battle of the River Plate. The old custom of publishing the despatches of admirals who have fought actions with the enemy, which was followed in the war of 1914-18, has unfortunately been abandoned in the present war, and this is the nearest—and up to the moment of writing, the latest—approximation to the valuable contemporary contribution to history which they provided. There is much of value to the student of war in the actual text of the Report which may well be lacking in unofficial condensations or paraphrases.

For the revision of the Reference Section, I am indebted to Mr. H. R. Mason. As in earlier war years, it makes no pretention to being complete, for few details of new ships—or even the fact of their coming into service—are allowed to be made known until they have already become public property through channels—such as neutral observation—which cannot be controlled. All that can be claimed for it is that it embodies all that has been published on the subject up to the end of 1941, the date to which it has been corrected. The Tables of Naval Ordnance, and of Naval Aircraft, which it is impossible to bring up to date, have become so much out of date as to be misleading; they have, therefore, been omitted. As before, a concise “Diary of Naval Events” for 1941 has been included in the Miscellaneous Section.

I desire to acknowledge with appreciation and thanks courtesy with which various authorities, British and Allied, have replied, so far as war-time restrictions would allow, to my requests for information or assistance.

H. G. THURSFIELD.

REVIEW OF 1941

CHAPTER I.

A NAVAL CHRONICLE OF 1941.

JANUARY.

IN the battle of the Atlantic British and Allied losses of merchant shipping, which had been falling ever since the previous September, still continued to fall slightly. But they remained at a disturbing figure nevertheless. British losses were just over 200,000 tons during the month and total losses just over 300,000. These were chiefly the work of U-boats, but a few Italian submarines—possibly seeking wider waters where they would be less subject to the attention of British destroyers than they were in the Mediterranean—were also sent to operate there. The destruction by H.M.S. Thunderbolt of one of them on December 25, while she was approaching a German occupied French Atlantic port under escort, was described in last years "Brassey". On January 6, another of them attacked the British S.S. Shakespeare, and succeeded in sinking her after an action lasting two hours.

The conduct of the Italian commander in the action—Lieutenant-Commander Todaro—was in marked contrast to the callous brutality displayed by most U-boat commanders in such actions. When the Shakespeare was rendered defenceless by a direct hit on her gun, twenty-three survivors took to their only serviceable boat. The submarine then closed in and sank the ship by more gunfire, after which she towed the boat to within sight of land, thereby giving its occupants a chance to survive.

Two days later an account was issued from the Admiralty of a gun engagement which took place on the surface in enemy waters between H.M. Submarine Tuna and a U-boat. On sighting the Tuna, the U-boat retreated, firing her after gun as she went. For nearly an hour the Tuna chased, firing too, and though not hit herself, succeeded in hitting the enemy at least once, but only on the conning tower apparently. Eventually enemy surface craft arrived, doubtless in response to the U-boat's call for help, and the Tuna was forced to dive and break off the fight.

The Air Force took a large part in operations against enemy coastal shipping, upon which he relied to an increasing extent for the ordinary communications and supply of his troops in occupied countries, and enemy warships. Bombing attacks were made on Brest on January 4, 5, 11, 12, and 15, from which it was concluded—though no official pronouncement was made—that the German cruiser, believed to have been the Hipper, which had made the Christmas Day convoy attack, was sheltering there. If so, it appears that she was not hit, though a hit on a destroyer was reported on January 4, and the raid of January 11 was particularly heavy. Enemy coastal convoys were attacked throughout the month, four ships being hit by bombs off the coast of Holland on January 17, and off the Norwegian coast two ships on January 4, one on 6 and two on 12. It was also reported, but not confirmed, that a number

of German transports ran into a British minefield off Egersund early in the month and were sunk, as many as 25,000 troops being drowned. Two German destroyers, and two minesweepers were also reported to have been sunk by British mines in Norwegian waters.

Bremen was attacked on January 1 and 2 and the naval base of Wilhelmshaven was bombed on 10, 15—a very heavy attack—and 18. The enemy retaliated in kind, for Portsmouth was attacked on 10, Plymouth on 15 and Bristol—very heavily—on 16.

On January 24 it became known that the new battleship King George V was completed and in service, when she arrived at Annapolis bringing the new British Ambassador to the United States, Lord Halifax, and his wife. The King George V sailed again the next day.

There was much activity in the Mediterranean during the month, chiefly in connection with the passage of convoys, British from west to east, enemy north to south between Italy and Lybia, but other opportunities were not neglected. On January 3 Bardia was bombarded from 8 to 9.30. a.m. by a battleship of the Mediterranean Fleet, an attack, which according to observers on the spot, contributed not a little to the fall of the place. The next day, Tobruk and Derna in their turn were bombarded from the sea before their capture on January 22 and 30 respectively, and the Navy, throughout the rapid advance through Cyrenaica of General Wavell's Army of the Nile continued its invaluable assistance and support to all shore forces. The 30,000 prisoners taken at Bardia, and 25,000 at Tobruk were taken back by sea, as were numerous tanks and mechanised vehicles which were out of action, but capable of repair. Supplies, ammunition, and above all water, were landed at numberless places on the open shore as the Army advanced, thereby providing great relief to the difficulties of keeping the rapidly advancing army supplied, and an immense saving of fuel, and wear and tear of land transport for which provision would otherwise have had to be made.

Submarines and air forces also co-operated at sea by harrying the enemy's communications with Libya. On January 1, Air Force bombers attacked shipping in the harbour of Tripoli, reported to include five cruisers, and made hits on transports lying there; the attack was repeated on January 6. It became known at this time that German reinforcements, largely of the *Luftwaffe*, were being sent to Sicily, passing from Naples by sea to Palermo and Messina to operate chiefly from Catania. Naples was bombed on January 8, a hit being reported on the battleship *Vittoria Veneto*, as was Palermo where transports were hit. Messina was attacked the following night, hits being reported on cruisers and on oil tanks. H.M.S. *Pandora* in the Sicilian Channel sank two transports by torpedo, one of which was seen to be carrying army vehicles.

Between January 7 and 13 a British convoy carrying chiefly military supplies for Greece was taken through the Mediterranean and was the cause of much fighting. It began early on January 11, when British forces near Pantellaria sighted the Italian destroyers *Vega* and *Cigno*. They were engaged by the *Southampton* and both received hits. The *Cigno* escaped, but was later beached to save her from sinking; the *Vega* was sunk. Later in the morning, the British destroyer *Gallant* was disabled by striking a mine, but she was got into Malta. As was to be expected, once contact with the enemy had disclosed the presence of the British Fleet, heavy attacks developed from the air.

Just after noon two Italian torpedo aircraft attacked the *Illustrious*,

the aircraft carrier of Admiral Cunningham's fleet, but their torpedoes were easily avoided and the enemy fled before the *Illustrious's* fighters. The next attacks were a very different thing. Some forty Ju.87 dive-bombers of the *Luftwaffe* attacked in wave after wave, concentrating chiefly on the *Illustrious* doubtless with the idea of depriving the fleet of the fighter protection she provided. In these attacks their losses were substantial, but they succeeded in hitting the *Illustrious* with a number of 1000 lb. bombs; for they were evidently of the crack Stuka squadrons of the *Luftwaffe*. The barrage put up by the fleet was tremendous, but they faced it and dived through it unhesitatingly, despite heavy losses, displaying a mettle never shown by the *Regia Aeronautica* which was all that the British Fleet had so far met in these waters.

Some of the *Illustrious's* fighters were already in the air when the Stuka attack began; all of them got off before the first hit, and they shot down many enemies. Two Fulmar pilots who had exhausted their ammunition in the early fights—and who presumably were precluded by the damage the ship had suffered from landing on it to replenish—made dummy attacks on the diving Stukas and so put them off their aim. The ship was severely damaged, some of her guns were out of action, fires were started in a hangar containing a number of aircraft with full tanks, the steering gear was out of action, and the engine and boiler rooms were full of smoke and fumes drawn with the air supply. But the fires were got under control, further attacks during the afternoon were fought off, and the ship reached Malta steering with her propellers.

Though they concentrated chiefly on the *Illustrious*, the other ships were occasionally attacked as well, and the Southampton was hit by a large bomb. This started a fire which eventually, some hours afterwards got out of control. She had to be abandoned, and as it proved impossible to tow her into harbour, she was sunk.

Nine Stukas were shot down during the day, and seven more were damaged so that it is doubtful if they could have got home.

The *Illustrious* remained at Malta for nearly three weeks, and was temporarily repaired enough for her to get away. The Stukas made repeated attacks on her there, but only succeeded in hitting her once, and that not badly. But so effective was the defence that thirty-seven Stukas were lost in these attacks, and on January 12, their airfield at Catania was attacked by the R.A.F. and over thirty of them were destroyed on the ground. When the *Illustrious* left during the next month, she steamed back to Alexandria at over twenty-five knots.

Though the fleet had thus suffered severely in its encounter with the *Luftwaffe* it had achieved its object. The convoy got through without being attacked at all. It was clear from this incident that the Germans, recognising how effective dive-bombing might prove against warships if employed in mass, had developed the method energetically. It was also clear that in waters which could be reached by Stukas in force, adequate fighter support would be essential to a fleet. Admiral Sir Andrew Cunningham made a signal to his fleet to say "We must shoot these pests out of the sky", and told them that the convoys would continue to go through; and so they did, as the subsequent chronicle will show.

The Greeks prosecuted the war against Italy with energy. Their submarines were active throughout the month in the Southern Adriatic and Ionian seas; their destroyers bombarded Valona on January 8 and destroyed an Italian submarine on January 21. The R.A.F. took a hand in

these campaigns by bombing both Brindisi and Valona, on January 19—the two terminal ports of Italy's communications with her armies in Albania—and also helped by bombing air bases in Rhodes on January 16.

The loss was announced during the month of the submarines *Regulus* and *Triton*; also of the French submarine *Narval* on January 9 and a Dutch submarine unnamed. Six trawlers and a drifter were also lost.

FEBRUARY.

In the Atlantic the losses of shipping began to increase again in February, but the increase was not very marked. The total of war shipping sunk by Germany during the month reached about 340,000 tons, of which some 260,000 tons were British. These losses were swollen during this month by another raid in the Atlantic by a German cruiser of the "Hipper" class.

On February 13 a British North bound convoy of nineteen ships was attacked between Madeira and the Azores, and no report was made public of the attacker being engaged by any warship of the escort, though no explanation was given of the omission. The precise arrangements for escorting convoys are not of course, made public, but it may, perhaps, be surmised either that the escort had not yet joined the convoy, or that it was otherwise engaged at the moment the attack was made. According to the accounts of survivors from the ships that were sunk, who were landed at Funchal the next day, the German cruiser opened fire on the convoy at dawn, fired for half an hour and then disappeared at high speed. Seven ships of the convoy were sunk, but the remainder succeeded in reaching harbour. The German account included the usual exaggerated claim, the actual number sunk being doubled.

It seems certain that the attacker must have again taken refuge in Brest as the R.A.F. attacks on that port began again on February 19, and on February 25 the Air Ministry, in a report of an attack made the night before, stated that its target was a cruiser of the "Hipper" class. It was reported that "a very heavy load of H.E. bombs fell in the area where the cruiser is berthed" but it does not appear that she was actually hit. Vice-Admiral Arnaud De La Perrière—a German, despite his French name, and a very well known U-boat commander in the last war—who was in command of the naval district which included Brest, was reported to have been killed in this raid.

The R.A.F. continued their constant attacks on enemy coastal shipping and the invasion ports throughout the month. On February 9, the aircraft of the Coastal Command made a torpedo attack on a German destroyer flotilla off the Norwegian coast and reported a hit on one destroyer which was presumably sunk although the destruction was not actually witnessed. On February 12, the Navy took a hand in the same sort of operation and the German-occupied port of Ostend was bombarded from the sea in the early hours of the morning.

On February 20 an exploit of a British submarine operating against shipping off the Norwegian coast was made public. H.M.S. *Sealion* encountered there a Norwegian ship of some 1,500 tons which was operating under German control, and made a signal to the master to abandon ship. The Norwegian master signalled "Thank you" in reply, and after waiting fifteen minutes to allow the crew to get clear, the *Sealion* sank the ship

by gunfire. She was so close to the shore that the crew were not at any time in danger.

A number of attacks on British convoys were made during the month by E-boats, operating chiefly off the east coast. They were all repulsed, but on the night of February 25 H.M.S. Exmoor, destroyer, was sunk by an E-boat's torpedo while escorting a convoy. She provided very effective defence, however, for neither the convoy nor any other ship escorting it suffered any damage.

In the Mediterranean General Wavell's advance through Cyrenaica continued and Benghazi was occupied on February 6. Men-of-war entered the harbour as soon as it was taken, but it was not taken into regular use as a base. To equip it for that purpose would have needed the installation of substantial harbour and anti-aircraft defences for which it is to be supposed resources were not at the time available. The German threat to Greece made it necessary for any such supplies that could be spared to be sent there for the time being.

On the morning of Sunday, February 2, naval aircraft from H.M.S. Ark Royal made an attack on a dam in the river Tirso in Sardinia. The reservoir formed by this dam is the chief source of electric power for the whole of the southern part of the island, including the naval base at Catania. The attack was made with bombs and torpedoes, the latter dropped into the reservoir and aimed at the dam. The Admiralty announcement of this operation stated that it was successful; the Rome radio denied that any damage was done. One of the attacking aircraft was lost, its crew being taken prisoner. This attack seems to have been timed so as to provide a diversion while a British convoy was being taken through the Mediterranean. The latter was achieved satisfactorily, all bomb attacks being beaten off.

A week later Admiral Somerville's forces again carried out offensive operations in the Western basin of the Mediterranean. At dawn on February 10 he appeared off the port of Genoa with the battle cruiser Renown, the battleship Malaya, the cruiser Sheffield, and the Ark Royal, with a number of destroyers in company. In the words of the Admiralty announcement "Military targets in and around the port of Genoa were subjected to a bombardment in which over 300 tons of shells were fired." The targets attacked included the Ansaldo electric works and boiler works, the power station, the docks, warehouses and harbour works, and the main oil fuel installation of the port. While this bombardment was proceeding naval aircraft at the same time dropped bombs on the oil refinery at Leghorn and the aerodrome and railway junction at Pisa. The Italians were apparently completely taken by surprise by these attacks. No reply was made by the harbour defences for some time after fire was opened and the whole British force withdrew without being attacked even from the air, to receive the usual enthusiastic reception on their arrival back at Gibraltar after this daring and successful operation.

Another convoy was successfully taken through between February 20 and 24. It was heavily attacked in the Sicilian Channel by dive-bombers of the *Luftwaffe*, but all the attacks were successfully beaten off and a number of enemy shadowing aircraft and dive-bombers were destroyed.

Submarines of the Mediterranean Fleet continued to operate successfully against the enemy's sea communications and on February 22 an Admiralty announcement described a number of successes by them. Two

convoys were attacked by H.M.S. *Truant*, one ship sunk in each, one by gunfire and the other by torpedo. The *Rover*, *Regent*, *Utmost* and *Upholder* each sank ships on the same route, generally in convoy, but the dates of their successes were not disclosed. Naval aircraft also took a hand, sinking one enemy supply ship on February 13 and three on February 16.

It should be realised that these successes, substantial though they were, did no more than take a toll from the Italian and German traffic passing from Italy to Libya. For every one ship that was sunk in the course of that passage, probably two or more passed on unscathed. The result of the attacks cannot be rated higher than the destruction of some 30 per cent. of enemy supplies and reinforcements to their African forces. As long as the enemy was prepared to accept losses on this scale—as he apparently was—he could rely on passing the balance across the sea successfully.

Two combined operations were undertaken in the course of the month, both of them on a very small scale; very few details of either were published. The first was the landing in Calabria of parachute troops on the night of February 10. Their instructions, according to a British official announcement, were to demolish certain objectives connected with the ports in that area. According to Italian accounts they failed to achieve any successes and were all taken prisoner. No further British announcement was made nor was there any hint that any of them had been re-embarked. The second was an expedition to the tiny island of *Castellorizo*, which is less than three miles from the Turkish coast and about equi-distant from *Rhodes* and *Cyprus*. British troops landed there on February 25, and they were withdrawn again, an official announcement stating that their objective had been accomplished, on February 28. The Italian announcement stated that they were driven out and that prisoners and booty had been captured. It is difficult to extract any particular credit for British arms out of this trivial and apparently unsuccessful operation.

Greek submarines continued their successful operations against Italian traffic to Albania. On February 23 their submarine *Nereus* sank one of two supply ships, on that run, which were being escorted by two Italian destroyers.

The Dodecanese Island, harbours, and air bases were the target for a number of bomb attacks by the R.A.F. on February 10, 11, 12, 13, 16, and 17.

Considerable progress was made in the army's advance through Italian Somaliland during the month, and H.M.S. *Shropshire* and the ships of the Royal Indian Navy successfully co-operated by bombardment from the sea of transport and troops along the coast. *Mogadishu* and *Kismayu*, were occupied during the month, and possession was taken of a number of German and Italian Merchant ships which were sheltering there, to a total of nearly 30,000 tons. This success had far reaching effects since it deprived the enemy of the only ports at their disposal fronting on the Indian Ocean, and the fact that they had made considerable use of them, was disclosed by the discovery and rescue of a number of British Merchant seamen who had been imprisoned there after their ships had been sunk by German raiders.

Losses of H.M. Ships during the month were very few. Four trawlers and one armed auxiliary vessel, H.M.S. *Crispin*, besides the destroyer *Exmoor*, already recorded.

MARCH.

Shipping losses continued to rise steeply in the month of March. It was about this time that the German submarines developed what they afterwards called the "wolf pack" method of attack, which developed out of the methods of collaboration evolved between U-boats and long-range bomber aircraft. It consisted of working submarines in groups of three to six instead of singly, as had been the universal practice up to then. They did not attack submerged, but used diving merely to escape observation. The method consisted of locating a convoy by day, keeping touch with it though out of sight, and making concerted attacks after dark at long range, the U-boats on the surface firing torpedoes from several different quarters.

This form of attack can only be countered by stationing the convoy's anti-submarine escorts at a much greater distance from the convoy than was suitable when the attacks to be expected were from submerged U-boats at close quarters. This needed escort vessels in much larger numbers to be effectual, and while the numbers were not available the new form of attack proved exceedingly successful. It was, in fact, a well thought-out method of exploiting our shortage of anti-submarine craft which during the whole of 1941 was only gradually being overtaken.

On March 18 the Prime Minister mentioned that the German battleships *Scharnhorst* and *Gneisenau* were at sea in the Atlantic and they had succeeded in sinking a number of British merchant ships which were sailing independently, not in convoy. This they had done so far west as Longitude 42°, more than half way across the Atlantic towards America. On March 22 a German High Command announcement stated that a German "battleship unit" was operating in the Atlantic under the command of Admiral Luetjens and had so far sunk a total of twenty-two armed merchant vessels and taken prisoner eight hundred survivors from them—a manifest exaggeration.

This account was followed up two days later by a broadcast describing how "heavy British naval forces including a battleship of the 'Malaya' class" had followed a German squadron for two days, vainly attempting to make contact while the Germans were attacking shipping near the Azores. On another occasion a battleship of the "Nelson" class was also stated to have been near the raiders. This account was manifestly intended to convey to the German public a picture of British battleships vainly endeavouring to interfere with the German ships in their attacks on British shipping. Actually the course of events was obviously very different. It is clear that the German ships approached a British convoy, discovered a battleship in its escort, and withdrew by use of their much higher speed rather than risk engagement with a more heavily armed ship. The convoy system, that is to say, in this case just as in the case of attacks by U-boats, provided a defence which was fully effective.

It is to be concluded, although no details were of course made public, that widespread dispositions were made with the object of bringing the German battle cruisers to action before they could regain shelter of their own harbours. These measures were obviously so effective that the German ships did not attempt to make the long voyage back to Germany round the north of the British Isles—the route by which in the long nights of the late winter they had evidently emerged—but took refuge in the strongly fortified port of Brest. They were located there by air

reconnaissance on March 30, and from that day onwards, attacks on them by British aircraft were continual and heavy.

Attacks on enemy coastal shipping off the occupied coast, from Norway to the Bay of Biscay, by British submarines and aircraft were continual throughout the month. On March 12 a German destroyer was attacked by moonlight by aircraft of the Coastal Command in the Skagerrak, torpedoed, and almost certainly sunk, although it was not possible for the attackers to remain and observe the final result. The enemy also continued his attack on British North Sea convoys, by E-boats as well as aircraft. A number of aircraft were shot down by auxiliary warships in the course of the month and the E-boat attacks were also effectively repelled. On March 26 the Admiralty announced that a number of such attacks had been repelled during the last few nights, and that a number of E-boats had certainly been damaged and probably sunk. No damage or casualties were suffered either by the ships in the convoys attacked, or by warships defending them.

Early in the month the first of the combined operations on a small scale, of which a number were carried out in the course of the year, was made in Norway. At dawn on March 3 a British expedition, consisting of troops conveyed and convoyed by warships, arrived at the two towns of Svolvær and Stansund in the Lofoten Islands in the north of Norway, the centre of the fishing industry which was supplying Germany with thousands of tons of fish oil from which glycerine for explosives is extracted. A number of German ships waiting to load with oil were found there. It was not possible to bring these ships away—they had probably not got steam up and in any case were not fast enough to be able to evade the air attacks which were certain to be made as soon as the defence realised what was happening—and they were therefore sunk to a total of 18,000 tons. The only German warship found there was an armed trawler which was promptly sunk. Meanwhile British troops and Norwegian seamen landed, and occupied the telegraph office first and destroyed a fish-oil factory and all stores of oil which were waiting shipment. Supplies of food, clothing, soap, and cigarettes were landed and distributed to the Norwegian inhabitants, and the passage to England was offered to any volunteers who desired to join the free Norwegian forces. Two hundred and fifteen German prisoners—all those in the place—were brought away, together with ten quislings who had been co-operating with them. As soon as they had finished what they came to do the whole expedition withdrew and returned to England without suffering a casualty.

The raid was remarkably well planned and organised and went without a hitch from start to finish. It gave great satisfaction in Norway and aroused corresponding fury in the Germans, who revenged themselves by savage and senseless reprisals on the inhabitants of the islands. The destruction of the fish factory had unexpectedly advantageous results for the Norwegians. Until it happened the whole of the fish landed was either sent to Germany or converted into oil in the factory, none of it being available for local consumption. After the raid fish could no longer be dealt with in the factory. As there had been no interference with the fishing industry, and fish was being landed in as great quantities as ever, it became plentiful and cheap throughout northern Norway.

MEDITERRANEAN.

During March the submarines and aircraft of the Mediterranean fleet continued to attack with success the Italian communications with Libya. On March 12 the Admiralty announced that a 10,000 ton Italian troopship had been sunk by a submarine which was not named. On March 20, it was announced that H.M.S. Utmost had sunk two large transports crowded with troops, and that H.M.S. Unique and Triumph had each sunk two ships which, being obviously heavily laden, were probably conveying tanks or mechanised transport.

Nor was it only merchant ships that were sunk by British submarines. On March 8 an Italian cruiser of the "Colleoni" class was torpedoed and sunk by an unnamed British submarine, in spite of being escorted and screened by two destroyers. Its loss was admitted by the enemy, who described her in their announcement as "a warship of medium size." The cruiser's escort apparently made no counter-attack, since the submarine was able to remain in the vicinity for two hours and observe the destroyers picking up survivors of the sunken cruiser.

During March British troops and supplies were transported in large numbers to Greece, with the object of reinforcing our Allies against the attacks which were being made on them by Italy and threatened by Germany. The Italian Fleet made no attempt for several weeks to interfere with this traffic, except that on March 6 the submarine Anfitrite encountered a British convoy in the Aegean sea and attempted to attack. She was at once destroyed by the convoy's escort and the convoy suffered no damage. It may be surmised that Germany protested to the Italian command against this inactivity, and urged an attack in force against the constant stream of British forces going to Greece. Some such stimulus must have been needed to induce the Italian fleet, towards the end of the month, to risk contact with Admiral Cunningham.

On March 27 Admiral Cunningham learned from air reconnaissance that Italian warships were at sea between Sicily and Crete, and he at once took his fleet to sea with the object of bringing them to action. The next morning air reconnaissance reported the Italian Fleet in two separate bodies, one of them consisting of two battleships of the "Cavour" class, three cruisers, and four destroyers. It was attacked by bombers of the R.A.F., but the result of the attack was not definitely observed and this body did not come into contact with the Mediterranean Fleet. The other Italian squadron consisted of the new battleship Vittorio Veneto, eight cruisers and nine destroyers. Shortly before eight a.m. part of it was located from the air about 50 miles south of the west end of Crete. A little after eight o'clock the British cruisers, Ajax, Orion, Perth and Gloucester, under the command of Vice-Admiral Pridham-Wippell, with destroyers in company, made contact with the Italian cruisers, at least three of which were big cruisers mounting 8-inch guns. As his force was definitely outmatched Admiral Pridham-Wippell fell back, keeping touch with the enemy who were chasing him, towards Admiral Cunningham's battle fleet, which was then one hundred miles or more to the south-eastward.

About 9 a.m. the Italian cruisers turned to the north-west. Admiral Pridham-Wippell at once turned after them in order not to lose touch, but after two hours' steaming to the north-westward the Italian new battleship Vittorio Veneto was sighted some sixteen miles to the northward.

The British cruisers once more turned to fall back on the British battle fleet and to keep out of the range of the 16-inch guns of the Italian battleship, which came on at great speed in chase. At 11.30 a.m., however, she was attacked by torpedo aircraft from H.M.S. Formidable—which had taken the place of the *Illustrious*—and the Italian battleship then also turned to the north-westward, warned, it is to be supposed, by this attack that the British battle fleet could not be very far away. A few minutes later a second torpedo attack by aircraft was made on her in which the attackers claimed one hit with a torpedo. If this claim was justified, which now seems doubtful, the torpedo produced very little effect, for the *Vittorio Veneto*'s speed does not seem then to have been reduced.

The British cruisers lost sight of the Italian battleship when she turned to the north-west, but the Fleet Air Arm kept touch. A torpedo squadron which attacked early in the afternoon reported making three hits which had the effect of greatly reducing the *Vittorio Veneto*'s speed. R.A.F. bombers from Africa made an attack during the afternoon and reported making hits on two cruisers and a destroyer. The *Formidable*'s aircraft made two more torpedo attacks just before dusk and though the *Vittorio Veneto* was not hit again, one cruiser was certainly then torpedoed.

One aircraft from the *Formidable*, piloted by Lieutenant-Commander Dalyel-Stead, was lost in all these attacks. One pilot who sighted the *Vittorio* just before dark reported that her quarter deck was nearly under water and she seemed to be steaming at no more than some eight knots.

Admiral Pridham-Wippell, who had been pursuing the retreating Italian Fleet even since he lost sight of them just before mid-day, sighted them again after all these air attacks just before dusk. He sent in a force of destroyers to attack them by night while leading his cruisers to the northward so that the destroyers would not be hampered. The British battle fleet in the meanwhile, consisting of the *Warspite*, *Barham*, and *Valiant*, had been coming on at its best speed, when it was reported to Admiral Cunningham that an enemy ship, evidently damaged, was lying stopped three miles southward of the course he was then steering. Hoping, no doubt, that this was the *Vittorio Veneto* he turned at once to port to engage. Actually the ship was probably the 10,000 ton cruiser *Pola*, which had been torpedoed and disabled just before dark. It may possibly have been her, and not the *Vittorio*, which was seen just before dark, down by the stern and hardly moving.

Before Admiral Cunningham reached her, however, three Italian cruisers were sighted crossing his bows from starboard to port. The leading cruiser was one of the "Colleoni" class and the other two were the 8-inch cruisers, *Zara*, and *Fiume*. They were followed by a number of Italian destroyers, and the whole squadron were apparently quite unaware of the presence of the British Fleet until they were illuminated by searchlights of the British destroyer *Greyhound*.

They were then no more than four thousand yards from the British battleships, which opened fire; in less than four minutes the two big cruisers were completely disabled and set on fire—one of them was hit by seven 15-inch shells at once—and the leading cruiser was also believed to have been sunk. The Italian destroyers which were following the cruisers were then seen to fire torpedoes, so Admiral Cunningham turned his battleships away to avoid them, leaving the British destroyers to engage the attacking Italian flotilla and to finish off the disabled Italian cruisers. This they did, sinking the destroyers *Vincenzo Gioberti*, *Maestrale* and

Alfieri by gunfire, and the three disabled cruisers Pola, Zara and Fiume by torpedo. No British ship suffered either damage or casualties

Later in the night considerable fire was heard in an area in which there were no British ships, from which it seems likely that Italian ships were firing on their own destroyers. Italian fire at night however, has not proved very dangerous to those on whom it is directed, so it is possible that no great damage was done on this occasion. The Vittorio Veneto was not sighted either during the night or the next day, which led to the supposition that she might possibly have sunk during the night. It is believed, however, that she succeeded in getting back to harbour.

Destroyers of the Greek Navy put to sea at once when the news was received of the action, but they were not fortunate enough to make contact with the enemy. The next day however, they assisted in picking up Italian survivors from the ships which had been sunk, who were found in boats and rafts in the position of the action. Fifty-five officers and eight hundred and fifty men were picked up, and more could have been rescued, but for the arrival of German dive-bombers to attack the rescuers. The latter were not damaged and two German aircraft, Junkers 88, were shot down; but Admiral Cunningham naturally withdrew his ships, sending a message in plain language to the Italian Commander-in-Chief suggesting that a hospital ship should be sent to pick up those he had had to leave.

The whole action was known as the Battle of Cape Matapan.

On the day of the battle the Italians announced that "Naval Units" had sunk a British warship inside Suda Bay in Crete. The craft referred to were probably motorboats such as had been used earlier at Gibraltar for penetrating boom defences; it may have been on this occasion that H.M.S. York was torpedoed and damaged.

In the Western Mediterranean there was an incident with the French on March 30. A French convoy of four merchant ships escorted by a destroyer had passed through the Straits of Gibraltar the day before, keeping inside Spanish territorial waters. They were intercepted by a British cruiser and five destroyers off the coast of French Morocco, as they emerged from Spanish territorial waters and before they entered French; so that the British ships were entirely within their rights of visit and search. But nevertheless a French shore battery opened fire on the British ships, fortunately without hitting them. This fire was returned in self-defence and the battery was silenced. No further action was taken against the merchant ships, although the British force would have been quite justified in doing so, and they escaped into the harbour of Nemours.

The advance through Somaliland continued throughout the month, the occupation of Italian Somaliland being completed in the early part of it. The Navy rendered assistance to the Army throughout this campaign. On March 16 a most successful combined operation recaptured Berbera, the capital of British Somaliland. The attacking force—which was conveyed by sea and supported by gunfire from the sea—consisting of British and Indian troops together with Arab and Somali levies which had been specially trained at Aden, was landed just before dawn by the Navy. The whole operation was completed by 9.20 a.m. and Berbera, the capital of British Somaliland, was once more in British hands. The reconquest of British Somaliland greatly assisted the attack on the Italian forces in Abyssinia, and thus also helped the conquest of Eritrea. Towards the

end of the month ships sheltering there began to attempt to escape, but as they did so, they were picked up by British forces in the Red Sea. The interception of the German s.s. *Oder* by H.M.S. *Shoreham* was announced by the Commander-in-Chief East Indies on March 24.

On March 10 it was announced that H.M.S. *Leander* of the New Zealand squadron had engaged and sunk the Italian armed merchant raider *Ramb I*, in the Indian Ocean. It was not known whether she had actually done any raiding, or whether the British capture of Somaliland had forced her to sea and she was merely trying to escape. When intercepted by the *Leander* she was flying the Red Ensign, but on being ordered by signal to stop, she hoisted the Italian colours and opened fire. The *Leander* at once replied and when she had fired five salvos, the enemy ship struck her flag and shortly afterwards sank. Eleven officers and eighty-nine men were taken prisoner.

Losses of H.M. ships were not heavy during the month of March, amounting to no more than the destroyer *Dainty*, the submarine *Snapper* and six of H.M. Trawlers.

APRIL.

Shipping losses during April continued to rise steeply, swollen in this case by the heavy losses incurred during the German occupation of Greece, and the withdrawal of British forces from that country. The total for the month was 580,000 tons, of which nearly 350,000 tons were British. Most of these losses, apart from those in coastal waters of Greece, were due to U-boats and long-range aircraft in the north-western approaches.

The offensive against the U-boats continued with success. On April 8 the Admiralty issued a statement on this subject explaining that the increased U-boat activity gave more opportunities for the counter-offensive. Details of individual successes were not disclosed, but it was announced that more than fifty German officers, and considerably more than four hundred men from German U-boats which had been destroyed, were held as prisoners-of-war in this country. Amongst the former was Commander Otto Kretschmer, lately in command of U.99, who was recognised in Germany as one of the most skilful of their U-boat commanders.

Coastal operations in northern waters on both sides were continued without pause. On April 6 aircraft of Coastal Command again torpedoed a German destroyer, in this case off the north coast of France. This destroyer was believed to have sunk, and another one was hit by a bomb. On April 29 a German destroyer was disabled by a bomb while escorting a convoy off the Dutch coast.

On April 12 a raid was made on another fish factory in Arctic Norway near Hammerfest. No British forces were employed in this raid, which was carried out by Norwegians only. It was conducted on the same lines as the Lofoten raid, factories useful to the enemy being destroyed, German prisoners and quislings brought away, supplies of minor luxuries being landed for the inhabitants, and any volunteers for service against the enemy being given passage to England.

On April 16 the Admiralty announced the loss of H.M.S. *Bonaventure*, torpedoed while acting as escort to a convoy. The *Bonaventure* was one of the ten small cruisers of the "Dido" class which were being completed at the beginning of the war. This was the first intimation that she had been completed, and was in service. The location in which she was lost

was not reported, and it is not known whether it was in the Atlantic or the Mediterranean.

Naval operations in the Mediterranean during April were concerned wholly with service to the Army, and it was on the whole a month of reverses. The German advance eastward through Cyrenaica started on April 3, and the British forces in that province, weakened by the contingents and equipment withdrawn and sent to Greece, were unable to stem it. Submarines and aircraft had continued to take heavy toll of enemy reinforcements crossing the Mediterranean to Libya, but despite the high proportion of their losses, sufficient reinforcements got through to give the enemy preponderance of strength. A British submarine on April 3 reported having sunk the Italian tanker *Laura Corrado* and an Italian submarine; a week later the Admiralty announced that a British submarine had made two torpedo hits on a 12,000-ton ship and one on a 6,000-ton ship in an enemy convoy bound towards Tripoli: but by April 13, the enemy had once more occupied the whole of the province of Cyrenaica, with the exception of Tobruk and its harbour, and the armies were facing each other once more on the Egyptian frontier with Sollum and Halfaya in enemy hands.

The Navy gave what support it could to the flank of the Army during this rapid campaign, and continued its operations against the Axis sea communications. On April 15 a whole Italian convoy of five ships escorted by three destroyers was wiped out by a British destroyer flotilla under Captain Mack of the *Jervis*, with the *Janus*, *Mohawk* and *Nubian* in company. All eight Italian ships were sunk with the loss on the British side of the *Mohawk*, which was hit by a torpedo and sank later, though most of her company were saved. On April 16 an air attack was made on the harbour of Tripoli by bombers of the Royal Air Force and torpedo-bombers of the Fleet Air Arm. Shipping in the harbour and anchored outside was their target. On April 19 British Commandos landed by night near Bardia, then in enemy hands, to destroy a particularly valuable store dump which had been left when the place was evacuated during the retreat. The expedition was completely successful, a bridge was blown up and guns which were mounted to defend the harbour were destroyed. Some sixty of the landing party were taken prisoner, but the remainder were successfully re-embarked.

On April 21, the Mediterranean Battle Fleet which had been covering the passage of a convoy through the Sicilian Channel, bombarded Tripoli at dawn, firing leisurely for forty minutes in the course of which some five hundred and fifty tons of shells were showered on the power station, fuel stores, harbour installation, and enemy ships in the harbour, including a destroyer and six transports. During the Fleet's approach to Tripoli four large German troop-carrying aircraft, a big Dornier flying boat, and two Cant long-range bombers were shot down by Naval aircraft, which also the next day affectively dealt with three Junkers 88 dive-bombers, shot down one, and damaged the other two. On April 22 it was announced that the Tetrarch had sunk a fully laden tanker bound for Tripoli.

On the other side of the Mediterranean, the course of the war was no more favourable. The German onslaught on Greece started early in the month. On April 9 the German Army reached Dedeagatch on the Aegean. On April 10 it reached Salonika and the advance through Albania and northern Greece was just as rapid. On both sides air attacks were made

on shipping. On April 14 British naval aircraft sank two Italian transports in harbour at Valona; simultaneously German bombers made heavy and repeated attacks on the Piraeus, the only well-equipped port in Greece. Ships were blown up in the basin and a large number of magnetic mines were dropped in it, so that it became impossible to use it as a port. On April 22 the Admiralty announced that naval aircraft had recently destroyed three important supply ships "intended for the enemy's armies in the Balkans," a 10,000-ton tanker, a 7,000-ton ammunition ship and a 6,000-ton supply ship. These ships were presumably bound for Valona or Durazzo.

On April 21 it was agreed between the British and Greek Governments that since it was proving impossible to hold back the enemy attack, the British Army should be withdrawn, and arrangements to that end were made. On April 24 the withdrawal began. Only open bays were available and the troops embarked at Raptis, east of Athens, Nauplia, just west of Athens, Monemvasia near Cape Malea, and the Gulf of Kalamata in the extreme south. When in the course of the withdrawal the R.A.F. evacuated the airfields from which they had been working, air support ceased both for the Army ashore and for the Navy afloat. The only effective opposition to German dive-bombers and troop-carrying aircraft dropping troops by parachute was the A.A. fire from the warships.

The enemy exploited this advantage to the full and was in fact able to prevent the embarkation of some thousands of troops at Kalamata by occupying that place, just before the British troops arrived. Nevertheless some five hundred reached the shores of the Gulf in the course of the two following nights and were brought away by destroyers, which came close in and sent their boats in just after dark. Despite all these difficulties 45,000 troops and R.A.F. personnel had been withdrawn by April 30, with the loss of only two destroyers, the *Diamond* and *Wryneck*, and four transports, only one of which had troops on board when she was sunk. Army Headquarters stated that the troops brought away were 80 per cent. of those originally sent to Greece. The Army announcement commented as follows:—

"This operation has only been possible as the result of great skill and devotion by all three Arms of the Services. Rear-guards who have covered the withdrawal have imposed on the enemy a slow and cautious advance in spite of his great superiority in numbers. The Royal Navy and the Merchant Service have shown great courage and devotion in the face of heavy and sustained air attacks against the ports and beaches where embarkation has taken place. The Royal Air Force and the Fleet Air Arm, although very heavily outnumbered, have played their part both in providing some measure of protection to ships during their passage and in conveying key personnel from Greece with transport aircraft."

An Australian officer, equally appreciative, made a comment to the same effect, but more concise. He said "The Navy did an unbelievable job unbelievably well." Admiral Sir Andrew Cunningham paid the following tribute to the Merchant Navy in his report of the withdrawal:

"Throughout these operations, under conditions of considerable danger and difficulty, there was no faltering, and the determined way in which ships fought back against the aircraft attacks with their defensive armament was magnificent. We of the Royal Navy and officers and men of the Imperial Forces realise the extent of the service rendered and of the debt owed to the Merchant Navy for their devoted work during these past few weeks."

The enemy took advantage of the pre-occupation of all British forces with the withdrawal to occupy the islands of the Aegean. German troops in motor-boats from Kavalla occupied the island of Samothrace on April 20 without opposition. Five days later the large island of Lemnos where

there was a small garrison, was invaded in greater force, and the garrison which had no air support, was overwhelmed after fighting valiantly for four hours. The islands of Sporades were next occupied by troops sent from Salonika and Volo and by the end of the month most of the Aegean Islands were in enemy hands.

The withdrawal of the British Army was made possible by the valiant rear-guard defence of the Greek Army. The Greek Navy also suffered heavy losses. Of its ten destroyers, three were sunk by German dive-bombers, as were eleven of its thirteen torpedo boats and every one of the thirty odd minor warships and auxiliaries. Seven destroyers, two torpedo boats and six submarines survived and joined the British Fleet at Alexandria. All Greek coastal shipping which had not been sunk or disabled by German attacks on the ports was brought away and none was left available to the enemy.

On April 26 H.M. Submarine Regent was sent to the harbour of Kotor to bring away Mr. Ronald Campbell, the British Minister to Yugoslavia. On her arrival she found that Kotor had already been occupied by Italian troops, but she nevertheless entered and established communications with the local Italian Commander-in-Chief, landed an officer to find Mr. Campbell and embarked an Italian Officer as a hostage in his place. "This tense but farcical situation continued for nine hours" in the words of the Admiralty statement describing it. The Regent was then attacked by bombs and machine guns of two Italian dive-bombers and the Captain, First Lieutenant and Coxswain who were on the bridge were slightly wounded. Thereupon the Captain, annoyed by this treatment, got under way, dived and went out of harbour under water taking his hostage with him, negotiating the passage through the minefields with the same skill and calm that he had displayed throughout the unprecedented situation.

In Eritrea, the capital Asmara was occupied on April 1, and the occupation of Massawa the chief port and naval base followed on April 8. Before the latter date the German warships there left before it should be too late. Of the five destroyers, three were located and promptly sunk by naval aircraft, the *Leoni* on April 1, the *Lauro* and *Daniele Manin* on April 3. The remaining two, the *Pantera* and *Tigre*, went straight across to the Arabian shore where they were scuttled by their crews. Four submarines which remained, however, were able to escape out of the Red Sea, and having been fortunate enough to make contact with German supply ships in the Indian Ocean and South Atlantic, were so able eventually to reach Bordeaux some five or six weeks later.

Besides the loss of the *Bonaventure* and *Mohawk* already mentioned, that of the armed merchant cruiser *Rajputana* was announced on April 23. The *Rajputana* was in the Atlantic, presumably on convoy duty, when she was torpedoed twice within two hours. Forty lives were lost, but the remainder of her company were saved. Of the Auxiliary Patrol, two yachts and three trawlers were lost during the month.

MAY.

Shipping losses during May showed a sharp decrease from those of April; the total was nearly 500,000 tons of which 380,000 were British. This total too was swollen to the extent of some 70,000 tons by shipping lost in the combined operations in the Mediterranean, and in the with-

drawal from Crete. But even so, the total was disturbingly high, though the steady increase of new anti-submarine craft coming into service gave promise of still better protection for the Atlantic convoys as time went on.

The chief event of the month in the Atlantic, however, was the episode of the new German battleship *Bismarck*. One of the regular reconnaissances by aircraft of the Coastal Command on May 21 located the *Bismarck* and the new 10,000-ton cruiser *Prince Eugen* in a Norwegian fjord near Bergen. Their presence there seemed to indicate an intention to get out into the Atlantic, and it was therefore important that the Commander-in-Chief of the Home Fleet, Admiral Sir John Tovey, should be informed as soon as possible if and when they left. A reconnaissance of their anchorage was therefore made next morning by a naval aircraft; it was found that they had left and Admiral Tovey therefore made the necessary dispositions to intercept them. On the evening of Friday May 23, the cruisers *Norfolk* and *Suffolk*, under the command of Rear-Admiral Wake-Walker, sighted the two German ships at the north entrance to the Denmark Strait—between Iceland and Greenland. The ice off the Greenland coast still extended about half way across the Strait, and the German ships were steaming fast to the south-westward along its edge. The visibility was bad, never more than six miles and down to less than a mile in haze or snow showers. The British cruisers could have been easily destroyed by the *Bismarck*'s fire in a very short time if they had come within range—as the Italian cruisers were by Admiral Cunningham's battleships off Matapan—and consequently the task of keeping touch while avoiding destruction called for remarkable skill on the part of Admiral Wake-Walker's ships. This was not lacking; the British cruisers kept touch throughout the night and kept the Commander-in-Chief continuously informed of the position and movements of the enemy. In consequence, next morning Vice-Admiral Holland in the *Hood*, with the new battleship *Prince of Wales* in company, was able to intercept the Germans and engage them.

Gunnery on both sides was good and the *Bismarck* was seen to be on fire at one moment; but not seriously it would seem, since her gunfire was not interrupted. Both the *Prince of Wales* and the *Hood* were hit. The damage to the *Prince of Wales* was not serious, but one of the shells which hit the *Hood* penetrated to a magazine and caused a vast explosion in which the ship disappeared within a few seconds. There were only three survivors from her company of some 1,500 officers and men.

The action ceased at about this time but the chase of the *Bismarck* was continued. Her speed appeared to be slightly reduced by the damage which she had received, and she was reported by flying boats of the Coastal Command which were then observing her movements to be leaving a wake of oil, as if one of her fuel tanks had been penetrated. The *Prince of Wales* renewed the action towards evening but when she did so the enemy turned away and broke it off. By this time the ships were some 200 miles east of the tip of Greenland. During the night the *Norfolk* and *Suffolk* still continued to keep touch, and just after dark a torpedo attack was made on the *Bismarck* by aircraft from H.M.S. *Victorious*. It was believed that one torpedo hit was made on the *Bismarck* in this attack, but if so, her speed seemed to be undiminished. Soon after 3 a.m. on Sunday, May 25, all ships ran into fog and touch was lost. Even the *Norfolk* and *Suffolk*, which had stuck to their quarry for thirty hours, were then shaken off.



H.M.S. Duke of York.
(*'Wide World' photo.*)



The crew of H.M. submarine Utmost, and their record.

British Official photograph.)

Nothing more was seen of the German ships for thirty hours more, and the period must have been one of great anxiety for the Commander-in-Chief of the Home Fleet and the Admiralty. There was nothing to show for what area the Bismarck was now most likely to make. She had received some damage, it is true, but its extent was unknown and it did not appear to have so far affected either her speed or her fighting efficiency. It might be, therefore, that she was in a condition to continue the enterprise on which she had sailed and to cruise in the Atlantic for the purpose of attacking British convoys, against which she was capable of doing enormous damage. It might be that she was bound for a rendezvous with the Scharnhorst and Gneisenau which would emerge from Brest to join her. She might be bound for the Mediterranean or the South Atlantic. On the other hand, her damage might be such as to make it necessary for her to return to a base at which she could be repaired; and if so she might make either for Brest, or one of the other Bay of Biscay ports, or she might endeavour to return to Germany, passing either west of Iceland as she had come out, or between Iceland and the British Isles. So dispositions to ensure that she should be located once more as soon as possible, whatever her destination, and if possible also to ensure that she should be brought to action by adequate force, before she could once more gain shelter of a port in German hands.

The nature of these dispositions is known only, of course, in outline. They include movements by the Home Fleet from north; by Admiral Somerville's squadron from Gibraltar, which consisted of the battle cruiser Renown, the cruiser Sheffield and the aircraft carrier Ark Royal; by the battleships Rodney and Ramillies which were escorting different convoys in the Atlantic; and by flying boats both from England and Newfoundland.

At 10.30 a.m. on Monday, May 26, these dispositions bore fruit. A flying-boat of the Coastal Command sighted the Bismarck, 550 miles west of Lands End—a position which indicated that she maintained a speed of some 25 knots at least since touch had been lost with her off Greenland—steering for the Bay of Biscay. The weather was bad, with a high wind, a heavy sea and a low cloud ceiling. The flying-boat inadvertently came too close to the Bismarck at the time of sighting, and was at once damaged by her A.A. fire. She was compelled to seek the cover of clouds and lost touch soon afterwards. At 11.15 a.m., however, reconnaissance aircraft from the Ark Royal gained touch and shadowed continuously from then on. Soon afterwards they were reinforced as shadowers by the Sheffield, sent by Admiral Somerville.

The Bismarck's position was such that it was possible for her, if she kept up the same speed that she had maintained throughout the last thirty hours to reach a French port before she could be intercepted by Admiral Tovey in the King George V, who was being joined by the Rodney. It was, therefore, most important that something should be done to slow her up. So an air striking force was sent off from the Ark Royal during the afternoon to attack her with torpedoes.

The weather was so bad that seas were coming over the Ark Royal's flying deck and in these conditions it is most remarkable that she should have been able to operate aircraft at all. But though they got away, so bad was the weather, that they could not bring off their attack. They returned to the Ark Royal and another attempt was made later, just before dark. This was more successful and two torpedoes hit the Bismarck.

One of them hit amidships, where presumably her under water protection was strongest, and this hit might still have been no more effective in slowing her up than the hit which had been made by the *Victorious's* aircraft on Saturday night. But the other torpedo exploded against the *Bismarck's* propellers and rudder and sealed her fate. She was reported to have turned two complete circles just after this hit and shortly afterwards to be almost stopped ; her speed thereafter, never exceeded 12 knots, if it reached as much.

For all that was known, however, the damage inflicted might have been but temporary, and no effort could be relaxed. During the night a destroyer flotilla under Captain Vian of the *Cossack*, consisting of the *Zulu*, *Maori*, *Sikh*, and the Polish destroyer *Piorun*, closed in on the *Bismarck*, shadowing her all night and engaging her, not only with torpedoes but also with gunfire. The *Piorun* was the first to sight the enemy and her captain was specially congratulated by Captain Vian for the skill and courage shown in his attack. More than one of the destroyers' torpedoes is reported to have hit ; after the *Maori's* attack a fire was seen on board and the *Bismarck* was believed to have stopped for a time. She was then some four hundred miles due west of Brest and Admiral Tovey was able to make sure of being able to engage her at daylight.

When day broke however, the weather was still so bad and the visibility so low that Admiral Tovey, who by then had been joined by the *Rodney*, delayed his attack until full daylight. The *Bismarck* was under way again and steaming at only slow speed and apparently uncertain of her steering ; but all her guns were in action and she fired once more at the *Norfolk*, which had returned to the chase and gained touch with her soon after dawn. At 9 a.m. Admiral Tovey engaged her with the *King George V* and the *Rodney* ; after a brief engagement all her guns were silenced, and she was seen to be burning in many places. Still there was no sign of her sinking, and so well built and protected a ship was she that it would have needed a disproportionate expenditure of ammunition to sink her by gunfire. Admiral Tovey therefore ordered the cruiser *Dorsetshire* to sink her by torpedoes. Two torpedoes hit her on the starboard side, and still she did not sink. The *Dorsetshire* therefore went round to the other side and fired another torpedo which hit her on the portside and that was the end. She heeled over and sank at 11.01 a.m.

A large number of men had jumped overboard in the last stages of the action when she was burning fiercely, and was incapable of further fight since all her guns were out of action. More were left swimming in the sea when she sank and the *Dorsetshire* stopped, after she had disappeared, in the middle of some three or four hundred of them. The sea was too rough to lower boats and all that could be done was to put ropes and ladders over the side to help them up. But while she was engaged in this work of rescue, a submarine alarm was received and she had to stop it. She was only able to pick up about one hundred men, some of whom died of wounds before they could be landed. Soon afterwards large forces of German long-range bombers arrived from the airfields of France and attacked what British ships they could then find. Their attacks were chiefly concentrated on a destroyer flotilla, and the destroyer *Mashona* was hit by a bomb and sunk.

While the attention of all was concentrated on the *Bismarck* as the most important quarry, the *Prinz Eugen* was able to escape notice and to reach Brest without being engaged. There she joined the *Scharnhorst*

and Gneisenau and became with them, a target for the bomb attacks of the R.A.F.

The object of the Bismarck's excursion into the Atlantic is obscure. It seems improbable that the German Naval Command can have advised that it should be undertaken, for it seems to offend against every strategic principle upon which the Germans insist so strongly. It is probable however that the German Admiralty considered, and reported to Hitler, that the Bismarck was not only practically unsinkable—as in practice she almost proved to be—but that having been in commission for several months and drilled to a high pitch of efficiency, she was more than a match for any other ship afloat. Moreover her speed was such that if she encountered an overwhelming concentration of British ships she should be able to out-distance them. It seems at least possible that Hitler—entirely sure of himself, but completely ignorant of all things naval—then insisted that she should be sent out to dominate the battle of the Atlantic. The Scharnhorst and Gneisenau had failed in that attempt, chiefly because they were unable to face engagements with the British battleships which they had encountered escorting the convoys with which they had come into contact. The Bismarck, if all that the German Admiralty claimed for her was true, could succeed where the smaller battleships had failed—as indeed she did against the Hood—so it may well be that he insisted on her despatch and upon her being provided with a fleet of supply ships at different points in the Atlantic so that she should be independent of bases. If that is really the explanation of this astonishing enterprise it shows once more how vain is the supposition that it is possible to design and build an unsinkable ship.

There is no speculation about the supply ships, however. No less than six of them were intercepted by British cruisers in the Atlantic in the course of the next three weeks.

MEDITERRANEAN.

On May 11 the Admiralty announced that a British convoy had been taken through the Mediterranean from west to east; it had been attacked on its way by Italian torpedo carrying aircraft and by Italian dive-bombers. Every attack was intercepted and broken up by fighter aircraft from H.M.S. Ark Royal before it could be pressed home. Seven enemy aircraft were destroyed and five more were damaged. No ship, either of the convoy or escort was damaged. Two British fighter aircraft were lost, but the crew of one of them were saved. Two days before this announcement was made the Italian account had been issued claiming more, but wholly fictitious, successes. By this account two British battleships were alleged to have been hit by torpedoes, an aircraft carrier (twice), two cruisers, a destroyer, and three ships of the convoy. It also claimed the destruction of thirteen British aircraft for the loss of five Italian, with three others damaged. This lying announcement was typical of Italian descriptions of all encounters in the Mediterranean.

While this convoy was passing through Benghazi was twice bombarded from the sea, early in the morning of May 8, and during the night of May 10. Two supply ships, apparently coasting from Tripoli, were sunk as they approached the harbour with the intention of entering it at dawn. On May 12 an enemy south bound convoy was attacked by naval torpedo aircraft and a destroyer was hit and set on fire, while an ammunition

ship of about 8,000 tons was blown up. Later in the month British submarines torpedoed another Italian destroyer, a 9,000-ton troopship, a 7,000-ton tanker, and destroyed by gunfire two ammunition-carrying schooners.

In the eastern Mediterranean the Axis occupation of islands continued. On May 4 Mitylene and Chios close to the Turkish coast were occupied by Germans, and the Cyclades by Italian forces from the Dodecanese. Crete alone was left in British hands, and the intention was that it should be held against the attacks which were certain to be made.

On May 18, however, the British Air Force were withdrawn from Crete. The reason for this withdrawal has never been officially explained, but it was later understood to be that the air forces available at the time were so inadequate that to keep them there would have certainly resulted in their loss, without achieving any adequate object. The result of their withdrawal was that there was no possibility of fighter support either for the British and Greek garrison in the island or for ships of the Mediterranean Fleet operating in the waters round it; and since the enemy had at his disposal all the air-fields both of the Dodecanese and of the Greek mainland, the seas north of Crete, across which any sea-borne invasion must necessarily come, could be dominated by enemy dive-bombers, unopposed in their own element.

To the fleet under Sir Andrew Cunningham's command was given the duty of insuring that no sea-borne enemy forces should reach Crete. Such an expedition could be dealt with by his light forces, cruisers and destroyers. But since there was always the possibility—though not perhaps the probability—that the Italian main fleet might attempt to interfere with British light forces so engaged, Admiral Cunningham had to keep the bulk of his fleet at hand to deal with that contingency. The crossing being short, there would be little time to spare in that event, and the British Fleet had therefore to be fairly close.

The German attack on Crete started on Monday, May 19, and it was conducted, as has been often described elsewhere, chiefly by air; but it seems that the Germans from the first intended also to send troops by sea, hoping no doubt, to be able by air attack to deter the British Fleet from interference. Bomb attacks on the fleet started at the same time as the attack on Crete. On the night of May 20, it was attacked by E-boats, but the attack was repelled, two E-boats being sunk and two damaged while no British ship was even damaged. On May 21, however, the destroyer *Juno* was hit by a bomb and sunk. On that day a large body of transports, chiefly small steamers and the wooden caiques by which most of the local trade of the Levant is carried on, was located from the air coming from Greece and evidently meaning to land by night at Canea at the western end of the Island. The convoy was escorted by two Italian destroyers.

A British force of destroyers supported by cruisers under the command of Admiral Glennie in the *Dido* was sent in by the Commander-in-Chief to demolish this convoy, which it did with complete success. The two Italian destroyers, when the British force attacked, at once fired off their torpedoes without hitting anything, and fled. One escaped, damaged, but the other was promptly sunk. The whole of the convoy was rapidly destroyed, the transports being sunk by gunfire and torpedoes, and the caiques either rammed or set on fire by a few rounds from a destroyer's pom-pom. No ship of the convoy, except the one Italian destroyer,

survived that attack and the German loss was put at over five thousand men together with much ammunition, equipment, and supplies.

These heavy losses however did not deter the enemy from making another attempt at the sea passage. Since darkness had proved a disadvantage to the invaders rather than the shield for which they had doubtless hoped, the next attempt was made by day, the enemy evidently hoping to be able to drive away the British sea forces by attacking with clouds of dive-bombers and so clearing a way for the convoy. The next convoy was reported on May 22, south of the island of Milo. Another force of British destroyers supported by cruisers under Admiral King in the Naiad, was sent in to deal with it. As they approached the convoy they became the target of tremendously heavy attacks by German dive-bombers. The Naiad alone had one hundred and ninety-one bombs aimed at her but she suffered only slight damage. Nevertheless in the face of this very heavy attack it was not possible for the ships to devote their undivided attention to the destruction of the enemy convoy, since their manœuvres were necessarily governed by the necessity of avoiding bomb hits, and much of their armament if not all had to be concentrated on the aircraft by which they themselves were being attacked. Nevertheless they broke up the convoy and sank a large number of the ships which composed it, though they were not able to destroy it completely.

About 2 o'clock that afternoon the destroyer Greyhound was hit by a bomb and sank. The destroyers Kandahar and Kingston went to pick up her company and the cruisers Gloucester and Fiji closed in to protect them whilst so engaged. The enemy dive-bombers which were still coming over in clouds thereupon concentrated their attacks on the two big ships and succeeded in spite of substantial losses in hitting them more than once. The Gloucester was hit late in the afternoon by a big bomb amidships which damaged her so much that she sank; all the enemy aircraft then concentrated their attacks on the Fiji. One bomb inflicted damage which made it necessary for her to reduce speed and that, no doubt, made it easier for the enemy to inflict further hits by which she too was sunk. Every gun in both ships was firing incessantly at the attacking aircraft, but although a number of them were shot down and destroyed, their immunity from any interference from fighters enabled them to achieve these substantial successes even against the formidable anti-aircraft armament of the cruisers. At dusk the Kandahar and Kingston picked up four-fifths of the Fiji's company, but it was not possible for them to rescue any of the Gloucester's. Since the latter ship, however, had been close to the island of Antikithera at the time she was sunk it was hoped that most of her survivors had been able to get ashore there.

Two enemy attempts at invasion by sea were thus completely defeated, although at the cost of heavy British losses; but there was still the possibility that some of the second convoy, which had only been dispersed by Admiral King's forces, not destroyed, might endeavour under the cover of darkness to reach Crete after all. Provision had to be made against that contingency. The destroyers Kelly and Kashmir during the night of May 22 were assisting the garrison of Crete by bombarding a position held by the German troops which had been landed by parachute. They remained off the coast as day broke the next day in order to deal with any of the second convoy that might still try to land. Two caiques did make an attempt, one of them full of soldiers and the other full of ammunition. They were both promptly destroyed by the Kelly and

Kashmir before they could reach the coast. Thus not a single German landed in Crete from the sea and no further attempt was made until after the defence of the island had been overpowered from the air and was abandoned.

But the destruction by the Kelly and Kashmir of the last two enemy vessels to make the attempt was achieved in full view of the Germans who were established at the aerodrome of Maleme which they had seized, and they no doubt summoned the *Luftwaffe* once more to the attack. From 5.30 to 8 a.m. the Kelly and Kashmir were attacked incessantly, hundreds of bombs being aimed at them. The Kashmir was first hit by a thousand-pound bomb amidships. She sank within two minutes. A little later the same fate overtook the Kelly and though the Junkers 87 which had hit her was damaged and plunged into the sea, as were many others that morning, she too sank in a few seconds. The German aircraft then turned their machine guns on survivors swimming in the sea—an action of which none but Germans could be capable. About noon the Kipling of the same flotilla came in to the scene and though she too was heavily attacked by dive-bombers, picked up all the survivors from the Kelly and Kashmir and took them safely away.

The fleet had done its job and had destroyed every attempt by the enemy by sea-borne invasion; but there was more work for it yet. By May 29 it was decided that the British and Greek garrison of Crete could no longer hold out against the German air attack to which in the absence of any air support it was being subjected, supported by German troops landed from the air who had succeeded in establishing themselves here and there. On that day, the garrison found itself no longer able to hold the vicinity of Suda Bay, the only harbour in the island. They withdrew from there, a brigade of Royal Marines under Major-General E. C. Weston forming the rear-guard. The garrison was then withdrawn, being embarked by night in small parties from the open shore on the south coast of the island, to reach which they had to march across the mountains. Nothing could be done in the day time in face of the enemy's unopposed superiority in the air, and the ships employed on the withdrawal were subject to air attack for practically the whole of their voyage to Egypt. Seventeen thousand troops however, were brought away from Crete at the cost of two destroyers, the *Hereward* and *Imperial*, and the A.A. cruiser *Calcutta* sunk. H.M.S. *York* too, which had been under repair at Suda Bay, could not be made sea-worthy in time to sail before that harbour was abandoned, and she had to be destroyed.

Towards the end of May British aircraft approached an Italian supply ship escorted by an Italian destroyer which was evidently bound for Tripoli. Thereupon the Italian ships turned into the French harbour of Sfax in Tunisia, the Italian destroyer remaining outside. Since the ship was obviously part of the Italian armed forces, and was using the French harbour in violation of international law, she was attacked there with bombs, when it became quite obvious that she had been laden with ammunition. The French Government at once despatched a protest to the British Government in which the facts were grossly distorted.

Three German raiders or supply ships were picked up in the Indian Ocean during the month. The Admiralty announced on May 10 that H.M.S. *Cornwall* had sunk a German armed merchant raider, which was afterwards stated by the Germans to have been named *Pinguin*. Like most German merchant raiders, she carried mines, and still had some on

board when she came under the Cornwall's fire. The mines exploded and there was much loss of life. Eighty survivors were picked up by the Cornwall, fifty-three of whom were the German ship's company and twenty-seven British prisoners taken out of the merchant ships that she had sunk. According to the German report she had sunk 140,000 tons of shipping during her cruise, which had lasted several months. The Cornwall was slightly damaged in the action. An Admiralty announcement on May 12 reported that H.M.A.S. Canberra and H.M.S. Leander of the New Zealand squadron had intercepted two of the raider's supply ships, the German s.s. Coburg and the captured Norwegian ship Ketty Brovig, each of 7,000 tons. A number of Norwegian and Chinese prisoners, taken from the raider's prizes, were rescued and sixty-five German prisoners were taken.

The losses of H.M. ships during the month were heavy. In addition to those already chronicled in the Cretan engagement and the chase of the Bismarck, the loss of four armed merchant cruisers was reported during the month, the Voltaire, Patia, Camito, and Queenworth. One submarine, H.M.S. Usk, was also lost together with two yachts, three trawlers and a drifter of the Auxiliary Patrol.

JUNE.

There was again a marked drop in the figure of shipping losses during the month of June. The total was some 330,000 tons of which 230,000 was British. There were no coastal operations during the month to swell the total, and the figure for loss therefore represented the result of the German campaign of direct attack on shipping. Evidently the protection afforded to convoys was improving, chiefly because the number of new destroyers, and anti-submarine craft such as corvettes, coming into service was steadily growing.

There were few depredations by surface raiders during the month. No less than six of the supply ships which had been apparently sent out into the Atlantic for the benefit of the Bismarck were intercepted. On June 6 the interception of three of them was announced, two more on June 9 and yet another on June 14. All these appear to have been sent out from Germany. But on June 23 the interception was announced of the s.s. Babitonga which had been sheltering in Brazilian ports since the beginning of the war. She had sailed from Santos on April 24 bound ostensibly for Vladivostok. But she obviously had no intention of going there and had been acting ever since as a supply ship for German raiders, surface or possibly submarine. When she left Santos she had on board a thousand tons of diesel oil in barrels—an item of cargo which was sufficient indication of her employment. The s.s. Alstertor was also intercepted at about the same time. She had nearly eighty officers and men of the British Merchant Navy on board, prisoners from the ships which had been sunk by raiders in the Indian Ocean.

The figure of merchant shipping losses for June were the last to be published. The Admiralty announced publication was being discontinued because the enemy could gain valuable information from it. This statement was not altogether convincing. It was of course clearly desirable that the result of individual attacks should not be published in such a form as to give the enemy information as to the successes or otherwise

of his tactics, which he could not obtain in any other way. But it was by no means clear how the enemy could obtain any useful information from round figures, of numbers of ships and tonnage sunk during any period, provided that publication was delayed.

On the other hand the practice of regular publication of accurate figures of number of merchant ships and total tonnage lost through enemy action was in accordance with the settled Government policy of telling the nation how the war was going, and not withholding news because it was bad. It also made it unnecessary for the British Government to take any notice of inflated claims of damage inflicted on convoys put out by the enemy from time to time. It was a common practice of the Germans, when they had made an attack on a convoy and were not quite sure of what the result had been, to announce to the world the sinking of some fantastically large number of ships, doubtless in the hope of provoking the British Government into a disclosure of the real result of their attack in order to refute the lying exaggeration of the German report. If this were successful it would of course give them valuable information as to the result of the methods and tactics employed on that particular occasion; and that would certainly have been very valuable to the enemy at the time he was seeking to devise new tactics which should counter the very efficient British anti-U-boat methods. As long as regular returns of the real losses were published, the British public and the world at large received such inflated claims with calm incredulity, for experience had shown that they were invariably far greater than the whole losses for the month in which any such claim was made; and there was thus no necessity for special contradiction of any particular lie. When regular returns were discontinued, however, the Government were faced with the alternative, whenever such an inflated German claim was made, of either leaving it to hold the field uncontradicted, or of issuing a special statement dealing with the particular attack which, if it were to be at all convincing as a refutation, must give the enemy the information for which he had been fishing. That indeed was the experience on more than one occasion after June.

One of the chief incidents in Home Waters was an attack on one of the two pocket-battleships, believed to be the *Lutzow*, off Egersund, at the south-west point of Norway. She was sighted, escorted by a number of destroyers, just before midnight on Thursday, June 12, by an aircraft of the Coastal Command on reconnaissance. She was attacked early the next morning by torpedo aircraft of the same Command and was undoubtedly hit, though she was not sunk. Together with her escorts she turned to return through the Skagerrak to Germany, and was sighted again off southern Norway. Later in the day she was located steaming homeward bound at very slow speed. She was evidently severely damaged but not, of course, beyond repair.

No move was made by the three ships in Brest during the month. They were attacked by the R.A.F. on the nights of June 10, 11, and 12. The R.A.F.'s offensive against enemy shipping passing up and down the occupied coast also continued without intermission, with such frequency that it is unnecessary to chronicle individual attacks. Kiel was bombed on June 2 and 24.

On June 27 H.M.S. *Gladiolus* and two other corvettes destroyed U.556, taking prisoner her captain, Lieutenant Wohlfarth, and forty of her company. Lieutenant Wohlfarth was already known outside the German

Navy, since he had broadcast on the German radio a description of how, on March 10, the U-boat which he then commanded had shelled and set on fire the unarmed Icelandic fishing trawler Reykjaborg, killing all but three of her crew. In his broadcast Lieutenant Wohlfarth said "It was a most beautiful sight to see her burning in the dusk."

A number of small craft in home waters did successful execution against German raiding aircraft. On June 5 H.M. Trawler Northern Sky shot down a Heinkel 111 without damage to herself or her convoy. On June 7 two Heinkel 111's attacked a convoy which was escorted by H.M.S. Cottesmore, a "Hunt class" destroyer. The first was shot down by the Cottesmore, the second by the combined gunfire of convoy and escort. On June 9 an Me.109 was engaged by H.M.S. Blencathra, another "Hunt class" destroyer and was so damaged that it crashed four miles inland. On June 23 an unidentified aircraft attacked some mine-sweeping trawlers and was shot down by H.M. Trawler Solon. Another attacker, a Heinkel 111, was destroyed by a convoy the next day.

In the Mediterranean a fresh campaign—fortunately a very short one—was thrown upon us by the necessity for the occupation of Syria by the Allies and the Free French, in order to prevent the development of its use by the Axis. Axis air forces had been making free use of Syrian airfields without resistance by the Vichy authorities. This of course could not be tolerated. The Navy's part in the campaign was confined to the support of the flank of the Army which rested on the sea as it advanced northwards from Palestine, and to dealing with attacks by the Vichy destroyers which remained in Syrian waters. The Axis aircraft which were endeavouring to infiltrate into Syria were probably using the Italian airfields of the Dodecanese as a stepping stone; it was therefore desirable in order to hamper their operations, to make those airfields unusable. It was presumably for that purpose that a large number of raids were made by R.A.F. bombers on Rhodes in the course of the month.

The operations started on June 8 on which day a British force was landed from the sea, presumably to take in rear the French position against which the Army was advancing. The next day according to the French account, two French destroyers were bombarding the British force on shore when three British destroyers approached from seaward. Fire was opened at nine miles range and the French reported that one British destroyer was hit. Whether or not that account was accurate—no British version of the affair was made public—the result of the encounter was that the French destroyers broke off the attack and retired. The next clash seems to have taken place on June 15, when a report was issued from Vichy that French naval aircraft had made hits on two British destroyers off Sidon. Another engagement took place at dawn on June 16 when two French destroyers engaged two British cruisers and four destroyers and one of the former, a destroyer of the "Chevalier Paul" class, was sunk, though it seems that nearly all her company were rescued. British fighter aircraft of the R.A.F. gave protection to the British naval force and intercepted a number of Ju. 88's, obviously working from French airfields in Syria, shooting down one, damaging others and driving off the remainder. At the same time British naval aircraft attacked shipping and warships in the harbours of Beirut and Tripolis with both bombs and torpedoes. On June 23 two French destroyers tried to interfere with British operations off the coast but were driven off as soon as they engaged. The following day British ships

bombarded Beirut. The operations were still proceeding at the end of the month.

Activity against the Italians in the Mediterranean was chiefly confined to attacks on the convoys crossing the Sicilian Channel. It would seem that great efforts were being made by the enemy to supply their armies in Cyrenaica through the port of Benghazi, as the R.A.F. attacked it practically every other day throughout the month. On June 3 R.A.F. bombers attacked a south-bound Italian convoy off the Tunisian coast. One ship of 8,000 tons was evidently laden with ammunition, because when hit by a bomb she blew up with such force that other ships in the convoy were damaged by the explosion. Splinters also hit one of the bombers which crashed into the sea and was lost. Another ship of the convoy was hit and set on fire and was believed to have been sunk, and other ships were also damaged. It seems probable however that in spite of this success the rest of the convoy reached its destination. A similar attack on a convoy was made on June 12 or 13. One ship of about 7,000 tons was set on fire and sunk.

Submarines were active at about the same time in this area, and on June 14 an Admiralty announcement described how one of them sighted an Italian armed trawler escorting two schooners. The submarine chased, engaged on the surface and sank all three enemy ships by gunfire. Another submarine torpedoed and sank a large tanker. Two attacks were made on Italian harbours; a fully laden supply ship was torpedoed in the harbour of the island of Lampedusa, while an armed merchant cruiser was similarly torpedoed in the harbour of Benghazi. On June 18 another Admiralty announcement reported that a submarine had sunk an Italian tanker of 3,000 tons and had destroyed three Greek caiques in enemy service and an Italian schooner. The caiques were on their way to one of the islands in the Aegean occupied by the Germans. One of them was laden with stores and was full of German soldiers; another was laden with drums of oil. The Italian schooner was carrying troops, ammunition and stores to another Aegean island occupied by Italy. In the central Mediterranean two supply ships bound to Libya had been sunk, together with a small sailing ship.

On June 22 another R.A.F. bomb attack was made on a convoy and though one ship of some 6,000 tons was hit it was not clear whether it was prevented from completing its voyage. On June 24 a successful attack by submarine on a 20,000-ton Italian liner was reported, the enemy being hit by two torpedoes. The same submarine also sank a supply ship in convoy. On June 26 the most successful attack of the month was made by R.A.F. bombers and naval torpedo aircraft working together. A convoy consisting of a number of merchant ships of 20,000 tons each was located off the south coast of Italy and attacked just before dark. Two of the ships were hit by torpedoes and a third was hit amidships by a heavy bomb. The final result could not be observed in the dark, but it seems certain that at least two of the ships were sunk.

On June 29 a submarine of the Mediterranean Fleet had an even more important success. She sighted two Italian 10,000-ton cruisers screened by four destroyers which she attacked. The leading cruiser, which was believed to have been the *Gorizia*, was hit by two torpedoes, one of which exploded her magazine and she sank at once. This left the Italian Navy with only three of the seven big cruisers it had possessed at the beginning of the war.

In the Red Sea, Assab, the last port in Italian hands, was occupied as the result of a combined operation on June 6. This was the end of sea operations in the Red Sea.

The loss was reported during the month of the destroyer Jersey, sunk by a mine, the submarine Undaunted, the armed cruiser Salopian and the sloop Grimsby, together with two trawlers and a drifter.

JULY.

The offensive against the U-boats in the Atlantic continued without intermission throughout the month. In accordance with the settled policy, its results were not made public in detail, but the First Lord of the Admiralty in a speech later revealed that it had been the best month in that respect for over a year. The destruction of one U-boat near Gibraltar was however reported through Spanish channels. It was said to have been sunk by naval aircraft not far from Gibraltar on July 8, where it was believed to have been lying in wait for a large British convoy of 27 ships which passed through the Straits on that day. If it is true that such a convoy passed—and there is nothing to prevent its being observed from the Spanish shore—it is exceedingly probable that any U-boat which endeavoured to attack it would be destroyed; but the destruction was more likely to have been wrought by ships of the convoy's escort than by aircraft.

The German Command did not claim to have sunk any shipping between July 11 and 28, but the next day issued a description of a concerted attack on a British convoy in which 19 ships, of 116,500 tons in all, were destroyed. This was amplified the next day to 140,000 tons, with the addition of corvette and cruiser sunk. Mr. Attlee, speaking of this claim in the House of Commons, said that it was certainly exaggerated by 350 per cent. and possibly by 700; and he gave an assurance that, in this vital sphere of the Battle of the Seas, we were well holding our own. The incident illustrated the disadvantage of the discontinuance of regular returns of shipping lost, since the enemy was able to extract, in contradiction of this inflated claim, a more or less definite statement of the results of their particular attack.

The offensive by the R.A.F. against German sea communications off the occupied coast was carried on with success. On July 7 aircraft of the Coastal Command located, off the Dutch coast, a convoy of eight enemy ships, of size estimated to have ranged from 2,000 to 5,000 tons, with a strong escort. They attacked and reported making hits on six of the eight ships, some of which blew up as if they were laden with explosives and others, hit by more than one bomb each, were considered to have been almost certainly sunk. Two days later considerable execution was done against shipping in the German occupied ports of Cherbourg and Havre. Six ships were so badly damaged as to be almost certainly destroyed. The raid was repeated four days later with similar results. An attack on the docks at Rotterdam on July 16 was believed to have put at least 17 enemy ships out of action. These were but a few of the air attacks on enemy shipping throughout the month.

These efforts of the Air Force were reinforced by light naval forces. During the night of July 23 the enemy endeavoured to pass a convoy through the Straits of Dover with a strong escort of E-boats and patrol-boats. It was attacked by British light forces and at least one of the

enemy patrol boats was sunk and others were seen to be severely damaged. There were no British casualties but the convoy, apart from the ships of its escort which suffered, seemed to have got through.

On July 30 the Fleet Air Arm took a hand by making an attack on German shipping in the Arctic harbours of Kirkenes and Petsamo, which were in use by the Germans as bases for their attacks against Russia in the Arctic. Not very much shipping was found there and the opposition was strong, both by anti-aircraft fire and in the air. The German sloop *Bremse* was twice hit by bombs, and four supply ships found in the harbour were also reported to have been hit. Three *Me.109*'s and one *Ju.87* were shot down; but British losses were heavy, for sixteen naval aircraft, presumably either *Swordfish* or *Fulmars*, were lost. On the same day aircraft of the Bomber Command of the R.A.F. successfully attacked a convoy of coasters in the Heligoland Bight in rainy and cloudy weather, sinking four of them.

Two enemy aircraft were shot down during the month by British convoys or their escorts, one on July 5 and the other on July 22. There was at least one particularly heavy attack by German bombers on July 4, in which the guns mounted on shore near Boulogne joined in from time to time, which was witnessed from the British coast. The attackers met with strong opposition and were beaten off.

The R.A.F. attacks on the German battleships and cruiser sheltering at Brest were continued on July 1 and 6, by which time it was presumably believed that sufficient damage had been done to the ships to make it impossible for them to move; it was therefore with some surprise that the public learned that on July 22 the *Scharnhorst* had disappeared from Brest. Next day she was located at La Pallice, 240 miles to the south, where it is to be supposed she had gone in order to complete her repairs in a port less disturbed by air attacks than Brest, since it is out of fighter aircraft range from this country. If so, the enemy was disappointed for she was at once attacked, not only in daylight the day she was located, July 23, but also that night. In the day attack she was reported to have been hit by a very heavy armour piercing bomb.

At the same time very heavy attacks were begun again at Brest where the *Gneisenau* and *Prinz Eugen* still remained. The new Fortress bombers recently delivered from America took part in these attacks for the first time, making their attacks from a height of some 34,000 feet. In these attacks seven direct hits were reported on the *Gneisenau* and a number of bombs fell round the *Prinz Eugen*, though it was not possible to be sure that she had actually been hit. British losses were substantial in these attacks, 15 bombers and seven fighters being lost. But they were successful, for the *Scharnhorst* evidently found La Pallice too hot for her and returned forthwith to Brest, where not only were the A.A. defences more fully developed but facilities existed for the repair of the new damage she had received at La Pallice.

Occasional air attacks were made on German ports and naval bases in the course of the month, Wilhelmshaven, Bremen, Emden and Hamburg being each attacked once.

A certain amount of sea activity was reported during the month in the Russia-German war. The German-controlled Rumanian port of Constanza was bombarded from the sea early in the month. In the Baltic, a number of German ships were reported to have been sunk in a Russian minefield on July 14. On July 19 a Russian attack by destroyers,

motor torpedo boats and aircraft reported sinking eleven German transports and one tanker for the loss of one torpedo boat. Later in the month the Red Air Force reported sinking a patrol ship and a 5,000-ton tanker, and damaging four other ships.

The Syrian campaign was very soon brought to an end by the submission of the Vichy authorities, who asked for an armistice on July 8. On July 3 Vichy announced the loss of a submarine off Beirut which had been attacking British ships operating off the coast. The next day the French naval auxiliary St. Didier was detected attempting to reach a Syrian port carrying 25 officers, 34 N.C.O.'s and 200 soldiers of the pro-Axis party. Her name had been painted out, she was flying the Turkish flag and was keeping as far as possible within the Turkish territorial waters on her passage. She was sunk by British aircraft in the neighbourhood of Adalia.

Just before the request for the armistice was made, one old destroyer, one armed tanker, eleven trawlers and gun-boats and ten other naval craft left Syrian ports under cover of dark, steamed northward along the coast and took refuge in the Turkish harbour of Alexandretta. There they were disarmed and interned by the Turkish authorities. The Vichy Government demanded their release from the Turkish Government. It was refused on the ground that they had taken refuge in the Turkish port from war-like operations in which Turkey was a neutral.

The campaign against Italy was continued on the same lines in the central Mediterranean. Naples was attacked by air on July 9, 10 and 20 with the object not only of interrupting the repair of ships in the dock-yard but also of hampering the shipping of supplies and reinforcements to Libya, many of which started from that port. Benghazi and Tripoli were again bombed, on the average, every other night. One particularly successful attack on the latter was made on July 13 when several ships in the harbour were hit and set on fire, including a small schooner which was evidently laden with ammunition, since she blew up. Severe execution was done later in that week, one large tanker being torpedoed by naval aircraft inside the harbour while lying alongside the Spanish mole, an exploit which called for the highest degree of determination and skill.

As usual, a number of attacks were made on the airfields of Sicily and the sea-plane stations at Catania and Syracuse. In an attack made on July 28 at these two latter places no less than 34 enemy aircraft were destroyed on the ground or the sea without a single British loss. Palermo was attacked on July 6 and 17, a cruiser and a number of merchant ships in the harbour being hit on each occasion.

Our convoys which passed through the Mediterranean in the course of the month did not always escape attack by the enemy. One of them from the westward was sighted on July 22 by Italian aircraft as it came within range of Italian bases. It was attacked that night by an Italian submarine which was promptly destroyed, and the next morning it was subjected to a number of air attacks by both high-level bombers and torpedo aircraft attacking simultaneously. Six of the latter succeeded in pressing their attacks home and three of them were shot down; all their torpedoes missed except one which hit the destroyer Fearless. Her casualties were not large, but she was disabled, and as it was impossible to detach a ship to tow her, her company was taken off and she was sunk. Two of the high bombers were shot down at the same time, chiefly by Fleet fighters it would seem, since three of them were then reported lost

although the crews of all were saved. The attacks continued throughout the afternoon and evening, but no more damage was suffered by the convoy or by ships of the escort, while two more bombers were shot down and one damaged.

In the small hours of July 24 an E-boat attack developed. One ship of the convoy was damaged but was able to continue her voyage; one E-boat was sunk and another was believed to have been damaged. After daylight a number of air attacks were made, one of them by German dive-bombers simultaneously with a high-level bomb attack. One German was shot down. Two Italian bombers and two torpedo aircraft were also shot down and one British cruiser and one destroyer suffered slight damage.

The Italian accounts of this engagement which were issued of course some time before the British version, related, with customary exaggeration, that three or possibly four ships of the convoy had been sunk and that a cruiser, destroyer and another ship of the escort had also been destroyed.

Italian convoys passing from north to south through the same waters were not so successful in getting through unscathed. On July 6 the Admiralty issued a description of some of the exploits of a British submarine working in the Sicilian Channel. An armed merchant cruiser of some 9,000 tons had been torpedoed and crippled; a 6,000-ton supply ship was torpedoed and sunk, and an even larger one which was carrying ammunition was also torpedoed and blew up. The s.s. *Polinda* was torpedoed and sunk while carrying supplies to the base of Cagliari in Sardinia. On July 16 an Italian convoy was attacked from the air when off the coast of Tripolitania. One 8,000-ton ship was hit by two bombs and sunk, and another was severely damaged though it is possible that she reached harbour.

On July 22 an attack on another convoy was made off Pantellaria by bombers of the R.A.F. A 5,000-ton ammunition ship blew up when hit by bombs; a 7,000-ton ship was hit by bombs and set on fire and later sank, and a 6,000-ton ship was also hit. Then naval aircraft took up the attack on the convoy, which was then reduced to one large tanker and one other ship. The tanker was hit by two torpedoes and sunk, and the escorting destroyer was also hit by a torpedo and disabled. Only one ship out of that convoy got through.

On July 30 the enemy airfields and sea-plane base at Elmas in Sardinia was attacked by the R.A.F. A number of enemy aircraft were destroyed on the ground while great damage was done to the air station buildings.

On the night of July 25 the enemy made an all-night air raid on Malta. Just before daylight a number of E-boats were discovered approaching the harbour and they were immediately engaged by aircraft and by the coastal defences. This was soon discovered to be merely a diversion, the real attack being made by special craft which attempted to penetrate the harbour defences with the object of torpedoing ships inside the harbour. These were engaged by the shore defences; eight of them were either blown up or sunk and none succeeded in penetrating into the harbour, nor did any of them survive to tell the tale. Four of the E-boats were also sunk, but the remainder got away and presumably reported seeing explosions and fires at the entrance to the harbour—evidently those caused by the destruction of the boom-crawlers. On this an official Italian communique described how the harbour had been penetrated and British ships torpedoed inside. This product of Italian imagination was

as usual issued before the correct version was available from British sources.

This attack on one of the most heavily fortified harbours in the world was carried out with remarkable skill and determination by the crews, two men to each, of the special torpedo craft employed. It appears to be about the only sort of sea operation in which the Italian Navy has been able to earn distinction. The repulse of the attack was chiefly the work of shore defences manned by the Royal Malta Artillery which is composed entirely of Maltese personnel.

In the Far East there were signs of the coming storm. On July 16 the Japanese Government resigned and was replaced by one of more bellicose views. On July 23 the Vichy Government announced that Japan had demanded the use of bases in French Indo-China as a temporary military measure to defend Indo-China against "De Gaullists, Chinese and British". French spokesmen made it known that Vichy had no objection to Japan's temporary occupation of such bases, as they were confident that there was no threat to French sovereignty there. A few days afterwards it was reported that a Japanese fleet consisting of seven battleships, three aircraft carriers and fifty-five destroyers had been seen steaming south along the Indo-Chinese coast. This surrender by Vichy to Japanese aggression gave rise to a warning and a protest by the U.S. Government.

Besides the loss of the *Fearless*, that of the destroyer *Waterhen* of the Royal Australian Navy, of the sloop *Auckland*, the corvette *Pintail*, and the auxiliary vessel *Lady Somers*, four trawlers and two drifters, was announced during the month.

AUGUST

In the course of the month it became known that Mr. Churchill had crossed the Atlantic in the battleship *Prince of Wales* in order to meet and confer with President Roosevelt in an unnamed harbour in the Atlantic. It was given out in Washington that Mr. Roosevelt had gone on a fishing holiday but it was an open secret how he was occupied. The subject and results of their conference are recorded elsewhere; it only remains to chronicle here that in the course of her voyage with the Prime Minister on board, the *Prince of Wales* met a large Atlantic convoy and steamed twice through the lines in order to greet it.

Though no definite figures were issued it was understood that the improvement in shipping losses of July continued during August. In one instance in which the real facts became public, it was clearly demonstrated that there was no modification of the German habit, in their published claim, of grossly exaggerating their actual successes. On August 24 a German announcement described how twenty-two ships, totalling 122,000 tons, were sunk by U-boat attack continued over several days, from a strongly protected convoy sailing from England to Gibraltar. The attacks really were made, but as the convoy put into Lisbon, Portuguese journalists were able to ascertain and publish what the real results had been. Only six ships and one tug, of a total tonnage of 11,094, were sunk. The German report was thus seen to have multiplied the real number of ships by three and the total tonnage by eleven.

Several blockade-runners or enemy supply ships were intercepted in the Atlantic during the month. On August 4 it was announced that the

German steamer Frankfurt of 5,500 tons which had left the Chilean port of Talcahuana in May had been intercepted while trying to reach a German occupied port. Of the four other German ships which had left Chilean ports about the same time one of them, the Erlangen, had already been intercepted by a British cruiser in the south Atlantic in July. On August 16 the interception of the German s.s. Norderney of 3,700 tons and the Italian 4,300-ton s.s. Stella was announced. The Norderney, which was loaded with 1,500 tons of rubber, 1,250 tons of castor seed, 97 tons of castor oil and 620 tons of hides, had been waiting to sail for over four months when she left Para, Brazil. All these commodities are those of which Germany is supposed to be particularly short.

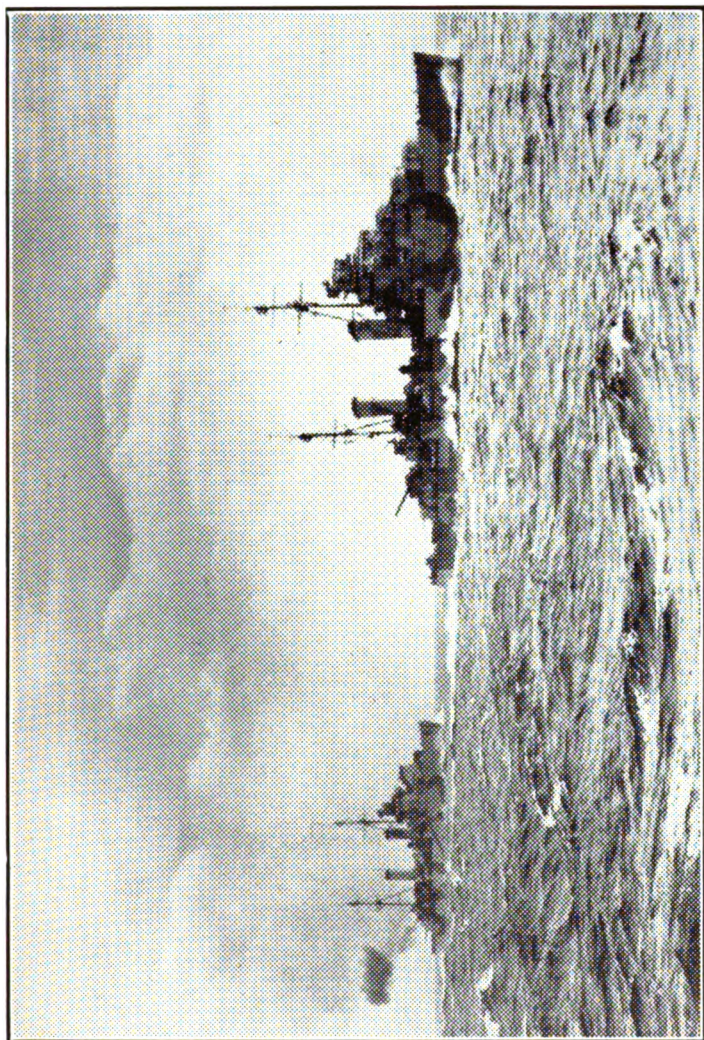
German shipping off the occupied coasts from Norway to France was attacked on every opportunity. Convoys were attacked off the Dutch and Belgian coasts on August 5 with bombs and on August 7 with cannon and machine-gun. On the latter occasion one tanker was set on fire. The policy of making daylight sweeps over occupied France by bombers escorted by fighters gave frequent opportunities for attacks on both shipping and the warships escorting it. Two enemy tankers were set on fire in one such attack on August 6. Three enemy patrol vessels were sunk off the Dutch coast on August 18. Shipping in Rotterdam was again heavily raided on August 28, and a German supply ship was bombed and hit off the Norwegian coast on August 20 by an aircraft of the Royal Netherlands Naval Air Service which was working with the Coastal Command.

German air attacks on British convoys in Home Waters were less successful. A twin-engined German bomber was shot down on August 4 by H.M. Trawler Norland. On August 14 a number of enemy aircraft made a determined attack on a British convoy, but it was beaten off by the fire of the convoy and its escort, one bomber being destroyed and two others were seriously damaged. A Ju.88 which attacked minesweepers on August 18 was shot down into the sea by H.M. Trawler Charles Doran, as was another on August 24 by H.M. Trawler Brabant.

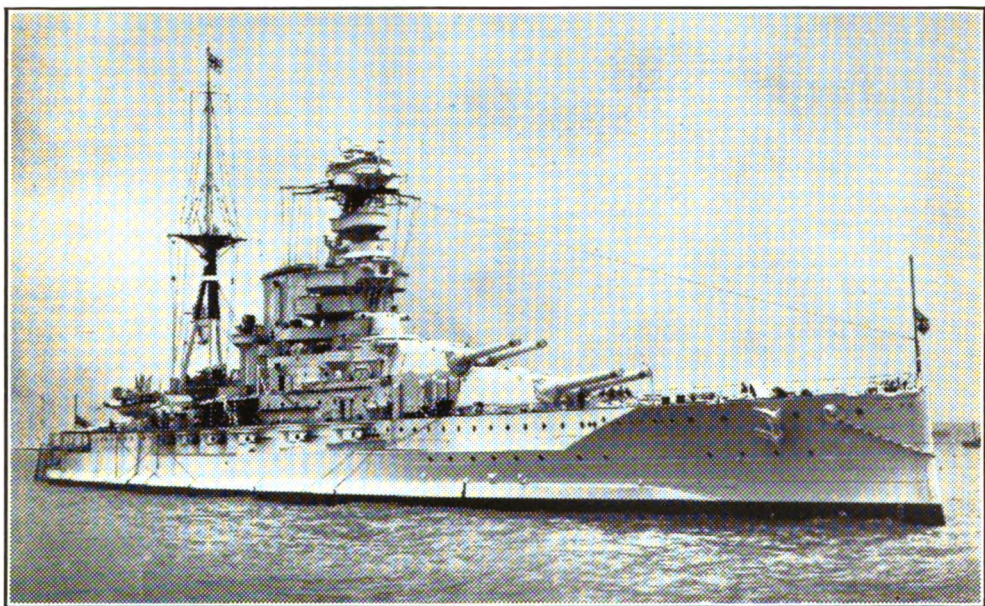
Three air attacks were made on Kiel in the course of the month, one by day on August 4 and another two by night on August 8 and 19. Emden was bombed on August 12. Brest and the German ships refitting there were attacked on August 16.

News about the sea war between Germany and Russia was scanty, but in the Baltic the Russian Headquarters reported on August 6 that a submarine had sunk one German transport laden with troops and munitions. A week later the destruction of a German submarine in the Baltic was reported. It appears that the Germans attempted to move troops by sea in the course of their advance in the north, for on August 22 the Russians reported sinking two enemy transports out of a convoy of five, together with two torpedo boats of the escort and driving the other three transports ashore. Three days later four more transports were sunk in the same way. This success appears to have been achieved by Russian surface forces of which the composition was not announced.

The Germans announced their capture of the ports of Tallinn and Baltiski on August 28. The announcement alleged that in the course of the capture 19 transports, a destroyer and nine other naval craft were sunk; the cruiser Kirov, another cruiser, and five other warships were damaged, while in the Gulf of Finland three Russian transports were sunk and a Russian destroyer hit by a bomb.



British cruisers in the Mediterranean.
(*British Official photograph.*)



H.M.S. Barham, sunk by U-boat in the Mediterranean, November, 1941.

In the Black Sea, which was dominated by the Russian Fleet, the important ship-building port of Nikolaiev was captured by the Germans on August 17. Certain warships were understood to have been under construction in the shipyards there, but they were effectively destroyed before the Russians left. On August 24, despite the Russian control of the Black Sea, the Germans attempted to move troops by transports escorted by motor launches. Four of them were encountered by Russian warships; two were at once torpedoed and sunk and the others driven ashore. On the same day a German submarine was reported to have been destroyed, but as it seems doubtful that any German submarine could have reached that sea, this may possibly have been a Rumanian, working in the German interest. An account was issued at the same time of how a Russian submarine penetrated into an unspecified Rumanian harbour and torpedoed two transports there.

In the Mediterranean more toll was taken of Italian warships by British submarines. On August 3 the Admiralty announced that an Italian cruiser, either the *Eugenio di Savoia* or the *Emanuele Filiberto Duca d'Aosta*, had been sighted by a British submarine, in company with a cruiser of the "Garibaldi" class and screened by destroyers. The submarine attacked and hit the first named cruiser with two torpedoes but was not able to make certain of the final result. It is unlikely however that a cruiser of that size could have survived two torpedo hits. At the end of the month a similar attack was reported by another submarine on three Italian 6-inch gun cruisers screened by destroyers and escorted by flying-boats. Again hits were made with torpedoes but it was impossible for the submarine, which was at once severely counter-attacked, to observe the final result.

A number of operations harassing to the enemy were conducted by Admiral Sir James Somerville during the month. At dawn on August 1 destroyers of his command entered the roadstead of Alghero and the harbour of Porte Conte in north-west Sardinia, bombarded the aerodrome and the naval air station—no shipping was found in either harbour—set the latter on fire and withdrew without damage or casualty. A bomb attack by aircraft from the *Ark Royal*, which had flown off before daylight, synchronized with this attack from the sea. On August 25 the *Ark Royal*'s aircraft attacked military objectives, understood to be cork forests near Tempio, in Sardinia. A press correspondent on board the *Ark Royal* reported that the Admiral's congratulatory signal included the information "Estimated enough burnt cork to give every Nazi a Hitler moustache". No enemy attacks on British convoys passing through the Mediterranean were reported during the month, except on August 26, when air attack on British shipping was reported to have been repulsed by fighters of the R.A.F. and Fleet Air Arm. But on the other hand a number of British attacks on Italian convoys took place. On the night of August 6 naval aircraft attacked a convoy of six ships with torpedoes near the island of Lampedusa. Two of the ships were sunk and the convoy, now consisting of only four ships, was attacked early the next morning again by R.A.F. bombers. Another large ship of some 8,000 tons was hit by two bombs and was believed to have been sunk while a fourth was also hit and badly damaged; but this last and the three others may well have got in. On August 14 this operation was repeated in the same way. A convoy was attacked consisting of five ships escorted by destroyers. Three of the ships and one destroyer were hit by torpedoes. Two of them

and a destroyer would seem to have sunk since only three were seen by reconnaissance aircraft the next morning. The next day R.A.F. bombers attacked two 4,000-ton tankers and two 800-ton schooners between Tripoli and Benghazi and hit all four ships. One tanker blew up and the other caught fire and burnt fiercely, so it is almost certain that they were destroyed.

On the night of August 17 a convoy of five large merchant ships and a tanker escorted by six destroyers was the target. One ship of 6,000 tons was torpedoed and sunk; the tanker was torpedoed and set on fire. By the light so given a second ship was torpedoed and had to be beached on Lampedusa where it was attacked and set on fire the next morning by R.A.F. bombers. It was still blazing on August 19. On August 27, in a convoy of four ships escorted by four destroyers, one ship was hit and set on fire causing a number of explosions. The next morning R.A.F. bombers found only two ships and attacked them. Both were hit and both set on fire. On the night of August 30 the Fleet Air Arm torpedoed a supply ship near Lampedusa.

All these attacks were ably seconded by submarines of the Royal Netherlands Navy operating with the Mediterranean Fleet. On August 9 one of them sank an enemy supply ship in a Mediterranean convoy and damaged one ship of the escort. On August 17 a description was issued of an attack by a Dutch submarine in which a 5,000-ton, fully laden enemy supply ship and a 1,000-ton sailing ship were sunk. On the latter date it was stated that the total enemy tonnage destroyed in the Mediterranean by Dutch submarines had reached 26,000 tons.

Benghazi, Tripoli and Bardia were attacked as before continually, on the average every other day. A number of attacks were also made on the seaplane stations at Syracuse and Augusta and the air station at Catania. Two enemy raids were made on the Suez Canal area and Alexandria in the course of the month, in which a considerable number of people were killed and injured.

On August 5 it was announced that the U.S. heavy cruisers Northampton and Salt Lake City, under the command of Rear-Admiral Taffinder had arrived at Brisbane in Australia in the course of a training cruise. The presence in the U.S.A. for repair in an American shipyard of H.M.S. *Illustrious* was revealed to the public in the course of the month.

The loss of two of H.M. submarines was announced during the month, H.M.S. *Cachalot* and *Union*. The loss was also announced of the destroyer *Bath*—former U.S.S. *Hopewell*, one of the 50 transferred from the U.S. Navy, which was being operated by the Norwegian Navy—the corvette *Picottee* and the minesweeper *Snaefell*.

SEPTEMBER

The shipping losses in the Atlantic continued to fall satisfactorily. On September 10 it was made known that one of the largest convoys of the war had just arrived from America without a casualty to a ship or a man, in the convoy or its escort. By the time this announcement was made the cargoes had already been unloaded and dispersed. The next day, as though to counteract this announcement, the German High Command issued an account of an attack by U-boats on a convoy of over 40 ships, strongly protected by corvettes and destroyers. The account related that "After several days of hard fighting they sunk 22 ships totalling 184,000

tons. Two other ships totalling 11,000 tons were torpedoed and were probably sunk. Attacks on the enemy convoy are still in progress." On September 25 a similar claim was made, that U-boats had sunk 11 out of a homeward-bound convoy of 12 ships off the west coast of Africa, the total loss being put at 78,000 tons.

On September 30 Mr. Churchill stated that the total shipping losses for the quarter just ended were only one-third of those during the previous quarter. That would make the total, of British, Allied and neutral shipping, somewhere about 472,000 tons for the three months. This figure, though far from being precise, of course, was sufficient to dispose completely of the German claim, earlier in the month, to have destroyed something like one-third of the quarter's total in a few days.

There were a number of casualties to American ships in the Atlantic. On September 4 the U.S. Navy Department announced that the destroyer U.S.S. Greer, bound for Iceland carrying mail, had been attacked by a U-boat which fired two torpedoes at her, both of which missed. The Greer at once counter-attacked with depth charges, but the result was not known. On September 6, about 300 miles south-west of Iceland three survivors were picked up from the American-owned steamship Sessa which had been sunk as long ago as August 17. She had been bound for Iceland carrying a general cargo belonging to the Icelandic Government. The day before it had been announced that the American S.S. Steel Seafarer had been sunk by bomb attack from the air at the entrance to the Gulf of Suez. All her company were saved.

Mr. Roosevelt referred to these attacks in a broadcast on September 11 in which he said " We have sought no shooting war with Hitler. We do not seek it now. But neither do we want peace so much that we are willing to permit him to attack our merchant and naval ships while they are on legitimate business. . . . In waters we deem necessary to our defence, American naval vessels and American planes will no longer wait until Axis submarines lurking under the water, or Axis raiders working on the surface, strike their deadly blow first. . . . Let this warning be clear. From now on if German or Italian vessels of war enter the waters, the protection of which is necessary for American defence, they do so at their own peril. The orders which I have given as Commander-in-Chief to the United States Army and Navy are to carry out that policy at once."

On the day of Mr. Roosevelt's broadcast, before he made it, yet another American ship was torpedoed and sunk while on her way to Iceland. Another, the Pink Star, was sunk on September 19.

The effect of the measures outlined by Mr. Roosevelt would seem to be that the United States from that day onwards assumed responsibility for the protection of all shipping in the American half of the Atlantic, though, of course, there was no detailed publication of the measures adopted to that end. This, of course, must have been a considerable relief to the strain on the British Navy, which could then concentrate on the protection of shipping in the eastern half of that ocean only.

On September 8 a remarkable capture was made. A Hudson aircraft of the Coastal Command sighted a U-boat on the surface and as it had dived by the time the aircraft arrived within reach, attacked it with depth charges. The effect of the attack was to damage the U-boat so that she had to be brought to the surface; there she was able to keep afloat but not to dive again. She then surrendered, but there was no surface ship in the vicinity to take possession of her, nor could that have been done if

there had been, for it was blowing a full gale, there was a heavy swell and it would have been impossible to board.

Before she was obliged to return to harbour to refuel, the Hudson aircraft was relieved by a flying boat which continued to patrol over the U-boat all night until one of H.M. ships could reach the spot. A British destroyer and other craft arrived in the morning but it was still too rough to lower a boat, though the weather was moderating; so the ships stood by keeping the U.570 and her crew, who were all on deck, covered with their guns. Eventually the weather moderated sufficiently for a British officer and men to be sent on board the U.570 by a Carley raft—a photograph of this incident is extant—where the German officers and crew were taken off and made prisoner. The U.570 was then taken in tow, and taken into harbour.

There were a number of raids in northern waters during the month. On September 9 a description was issued of an attack, made by a force under the command of Rear-Admiral Vian, on German convoys, and their escorts, which were supplying German armies on the Murmansk front. The attack was made at night and achieved complete surprise. The sloop *Bremse*, which had been damaged in the earlier air attack at Kirkenes, a German destroyer, an armed trawler and another vessel were sunk; but it would appear that the convoy they had been protecting escaped. The German account admitted the loss of the *Bremse* but not of any other craft, and stated that Admiral Vian's force consisted of a cruiser and two destroyers—which may have been correct. The night was very dark with patches of fog, which probably accounts for the escape of the convoy. A convoy attacked in the Channel the same night was not so fortunate. It consisted of two supply ships with a strong escort of other enemy craft; it was attacked by motor torpedo boats including one manned by the Royal Norwegian Navy. Both the supply ships were torpedoed and sunk—they were evidently laden with ammunition, since they blew up when hit. One E-boat was sunk and an armed trawler was set on fire, but the only casualties in the British ships were four wounded. Three days later another German convoy, in the far north again, was attacked by naval aircraft in the vicinity of Bodo, south of the Lofoten Islands; one ship was sunk and the remaining ships of the convoy were damaged while an aluminium works and an electric power station, known to be working in the enemy interests, were bombed and set on fire.

Enemy attacks on British convoys were less successful. An E-boat attack on September 20 was driven off without loss or damage to either the convoy or its escort. On September 9 details were published of a combined operation at Spitsbergen, where the coal-mines and stores of coal were destroyed to prevent them being available to the enemy in Norway. There was no opposition, so no detailed description of this raid is necessary here.

In the Russia-German war a German attempt to land on the island of Oesel in the Baltic at the mouth of the Gulf of Riga, was repulsed by Russian naval and air forces working in conjunction with the shore defences. The Russians reported sinking four transports and one destroyer and damaging others. The Germans would seem to have thereupon abandoned their sea-borne attack on this island in favour of working round by the shore. As they advanced northward through Latvia they crossed the narrow strait to the small island of Moon and thence to Oesel, which they claim to have occupied completely by September 21.

In the Gulf of Finland German reports claimed two hits each with heavy bombs from the air on the battleship *October Revolution* and the cruiser *Kirov*, four hits on another big cruiser, and damage to three destroyers, one minesweeper and a gun-boat. Two days later the Russians claimed to have sunk a German cruiser and three days after that a German communiqué spoke of mining operations and seemed to indicate that the Germans were attempting to bottle up the Russian ships inside the Gulf of Finland.

In the Mediterranean British forces continued to attack Italian convoys in the central Mediterranean when they could get at them. On the night of September 2 a convoy of some five ships guarded by seven destroyers was located by the Fleet Air Arm making for Sardinia and was attacked with torpedoes. Two large ships were hit and blew up ; two others were seriously damaged. The whole convoy was obviously completely surprised and thrown into utmost confusion, the ships nearly colliding with one another, while the destroyers fired wildly in every direction, even at their own ships. The next day the Fleet Air Arm torpedoed and sank an Italian destroyer just off Tripoli. On that day an Admiralty announcement described the exploits of a British submarine which followed a convoy along the Libyan coast, sinking two schooners in it. Other attacks in the central Mediterranean were also mentioned. It is not possible to specify the dates upon which attacks by British submarines were made, since the announcements relating to them were only issued after their return to harbour, and did not as a rule reveal when the incidents described took place.

On September 5 another report of submarine exploits was published. An Italian 8-inch cruiser had been hit by torpedoes not far from the Straits of Messina but it was not possible for the submarine to observe the result of the attack. Damage only, not the destruction of the ship was, therefore claimed ; possibly air reconnaissance revealed that she had survived the attack, but after a torpedo hit she would certainly need some months for repair. Another submarine encountered a convoy of three large liners of the 23,000-ton " *Duilio* " class which were known to be in use by the Italians as troop transports. They were well suited for that purpose, since they were fast ships and could make the short passage across the Sicilian Channel in a minimum time. The submarine torpedoed one of these three which was almost certainly sunk. In another convoy a tanker and an 8,000-ton supply ship were sunk by torpedoes and the 5,000-ton liner *Acquitanian* was torpedoed and damaged.

On September 6 the Fleet Air Arm located a convoy of three ships escorted by three destroyers and attacked ; one of them, a tanker, was hit by two torpedoes and severely damaged, another ship was hit by three bombs and set on fire, a number of heavy explosions taking place. On September 8 and 9 more submarine exploits were announced. The 11,400-ton liner *Esperia* was torpedoed and sunk, despite an unusually strong escort of destroyers, torpedo boats, motor torpedo boats, and flying boats, which seemed to indicate that she was carrying an especially large load. Another submarine torpedoed and sank a fast 4,000-ton ship of the " *Ramb* " class in a convoy bound from Taranto to Benghazi, a third torpedoed a large Italian schooner somewhere in the central Mediterranean, and a fourth attacked with gunfire two motor lighters just outside the harbour of Benghazi, despite the proximity of the fortifications.

On the night of September 11 a convoy of eight merchant ships was located in the central Mediterranean and a series of attacks was made on it. The Fleet Air Arm first torpedoed two ships, one of which blew up and the other was set on fire. The next morning the remains of the convoy was attacked by R.A.F. bombers. They made two hits on each of two ships, one of which was set ablaze and almost certainly lost. The attacks were resumed that night near Tripoli, when three of the remaining ships were torpedoed by the Fleet Air Arm and two were set on fire. Later still the R.A.F. took up the attack, set two more ships on fire with bombs and made hits on three others. Not one of the ships of the convoy escaped damage, though since the last attack took place close to Tripoli it is probable that some of them were got in.

There was then something of a lull for a week. During that period reports were issued of the exploits of Dutch submarines working with the Mediterranean Fleet. On the 15th it was announced that one of them had sunk a 6,000-ton supply ship; on the 20th that another had torpedoed a similar ship; had sunk a 12,000-ton ship and had sunk a sailing vessel by gunfire. The same day the Italian radio admitted the sinking of two liners but alleged that nearly all the troops they carried had been saved. This took place actually on September 18 when a convoy of three liners, all of some 24,000 tons or more, encountered British submarines. Two of them were sunk and the third was damaged.

The R.A.F. were busy at the same time. On September 20 they reported sinking by bomb attack a fully laden south-bound ship off Kerkenah, and hitting a destroyer close to Tripoli. A number of schooners were also bombed, one of which was evidently carrying ammunition, for she blew up with a tremendous explosion when hit. More submarine exploits were published at the same time. One of them had torpedoed a transport which was believed to have sunk and a 1,500-ton supply ship which was set on fire. A mine-layer of the "Crotone" class was hit by a torpedo and probably sunk and so was a 5,000-ton supply ship. The same submarine sank by gunfire a schooner under the fire of an Italian shore battery. Two ships were torpedoed and sunk at the same time by the Fleet Air Arm.

British submarine activities were not confined to the Central Mediterranean. On September 5 the Italian tanker *Maya* escorted by an Italian destroyer which was approaching the Dardanelles, doubtless with the object of passing through them in order to fetch a cargo of oil from Rumania, was torpedoed and sunk by a British submarine.

Nor was the Italian Navy entirely inactive. On September 22 a night attack was made on ships at Gibraltar by some sort of motor-craft, probably of the same sort that attempted to penetrate the harbour at Malta. The Italians claimed to have sunk two big tankers, an ammunition ship, and another ship. The claim was exaggerated; actually one of the coal hulks anchored in the Bay was sunk.

Towards the end of the month the enemy located one of the British convoys which was passed through the Mediterranean and delivered a series of attacks on it. According to the Italian account—which was, of course, published before the British version—the enemy succeeded in sinking two heavy, and one light cruiser, and damaging one battleship, one other large ship, unspecified, six smaller ships and one destroyer. Of the convoy, they asserted that one ship had been torpedoed and sunk off Algeria, that one had been sunk in the Sicilian Channel by Italian war-

ships and that two, totalling 23,000 tons had been sunk by torpedoes from aircraft between Sardinia and Tunis.

These claims were as usual the product of wild exaggeration. The actual result of the two to three days operations was that one ship in the convoy was torpedoed and disabled ; and that as it proved impossible to tow her she had to be sunk by our forces, but there were no casualties. The battleship Nelson was hit by a torpedo from aircraft but it only resulted in her speed being slightly reduced. Thirteen enemy aircraft were shot down for the loss of three British naval aircraft, the crews of two of which were saved. During the operations the Italian Fleet was reported to be at sea and Admiral Sir James Somerville, who was in command, made every effort to gain contact with it. He failed, since, as usual, it was able by dint of its high speed to avoid action.

Tripoli and Benghazi were raided with great frequency by R.A.F. bombers, some fifteen or sixteen times in the course of the month. The airfields of Sicily, at Catania, Gerbini, Syracuse, and Augusta were also attacked with fair frequency, as were occasionally Palermo, Messina and other Italian ports. The enemy raided Tobruk on September 2 with about 100 aircraft and again on September 3. He also raided Cairo where a number of casualties were caused during the month.

There were indications during the month of the coming extension of the war to the Pacific. Persistent reports were current in the Panama Canal zone that distress signals, indicating the presence of a raider somewhere near the Galapagos islands, had been heard. It seemed doubtful if these reports had any real basis, since nothing more was heard of this raider ; but in accordance with Mr. Roosevelt's declared policy the American Navy took steps to deal with the situation. At the other side of the Pacific a number of reinforcements for the garrison arrived at Singapore on September 30.

The loss was announced during the month of the corvettes Levis, of the Royal Canadian Navy, and Zinnia, of the submarines P.33 and P.32, the auxiliary Tonbridge and three of H.M. Trawlers.

OCTOBER

In a speech reported on October 1 the Prime Minister said that although the Germans were using larger numbers of U-boats and of long-range bomber aeroplanes to attack our sea communications in the Atlantic, yet our counter measures had proved so successful that the losses of shipping by enemy action had continued to decline. At the same time he deprecated any premature rejoicing and gave warning that the attack would certainly be intensified.

The improvement in defence of shipping was illustrated towards the end of the month when the enemy, by the device of making a grossly exaggerated claim about the result of a particular convoy attack, succeeded in eliciting from the Admiralty a statement of what the real result had been. The enemy announced that U-boats had sunk fourteen ships, totalling 47,000 tons, out of one convoy homeward bound from Gibraltar ; a week later the Admiralty stated that in reality only four ships, totalling 8,772 tons had been sunk—which is perhaps just what the German High Command wanted to know.

The Prime Minister's report of the efficiency of British defence of convoys was strikingly confirmed during the month by a German broad-

caster, who was obviously making some excuse for the lack of success of the air attack from which Hitler had himself prophesied so much. The German spokesman in the course of his broadcast said "To-day an attack on a convoy can be compared with nothing less than a desperate assault on a mighty and powerful line of fortifications. . . . It seldom happens nowadays that aircraft succeed in surprising a British convoy ; the enemy has become so efficient and vigilant. . . . For our bombers to get at the ship is to go down to the shadow-land of death. No description can even give the remotest impression of what German airmen have to face, and what it is really like when the British escort ships open fire from all their guns."

One of the new measures adopted for the defence of convoys against air attack was made public for the first time in the course of the month. This was the method of providing fighter protection for convoys after they had passed out of the range of shore-based aircraft. There are not in existence enough aircraft carriers for one of them to accompany every convoy through the zone in which it is subject to bomber attack ; it is therefore necessary to devise some other means of carrying fighter aircraft to sea. This has been done by fitting a certain number of merchant ships to carry Hurricanes, with a catapult for putting them into the air. Aircraft carried in these ships did remarkable service on many occasions against the Focke-Wulf bombers, but their operation was a particularly hazardous task. It was not possible to provide a deck upon which they could alight at the end of their flight, for that would have entailed practically rebuilding the ship. The instructions to pilots therefore were that if at the end of their counter-attack on the bombers they were within reach of an airfield on shore, they should land there. If on the other hand they had insufficient fuel to reach an airfield, they should put their aircraft down in the sea close enough to a ship of the convoy or escort for the pilot to be picked up. If the latter expedient had to be adopted it might or might not be possible to salve some part of the aircraft, and it entailed of course, not only great discomfort, particularly in wintry and stormy seas, but great risk to the pilot ; for a Hurricane aircraft if damaged in combat might well sink in a few seconds after alighting on the sea, as indeed more than one did. The pilots manning the aircraft carried in these ships were drawn partly from the Fleet Air Arm and partly from the Fighter Command of the R.A.F. Their gallant service was instrumental in saving numbers of merchant ships from destruction.

Yet more evidence of the successful defence of British shipping in the Atlantic was provided by the announcement made in Washington on October 7 that Great Britain would shortly release to the United States some ten to fifteen tankers which had been on loan to this country. The number on October 23 was increased to forty.

On October 8 the U.570, the capture of which complete was described in September, was brought into a British port in charge of a British crew. Photographs of her appeared in the press. A few days later, on October 8, another capture of a U-boat was made, in this case by H.M. Trawler Lady Shirley, though the U-boat herself sank before she could be brought in. The Lady Shirley was on patrol somewhere west of Gibraltar when early in the morning the look-out sighted an object which the captain, when he saw it just before it disappeared, recognised as the conning-tower of a U-boat. The trawler at once steamed to the spot and dropped depth charges, whereupon the U-boat, which was severely damaged and leaking,

broke surface only 500 yards away. As the conning-tower appeared the trawler kept it under machine-gun fire, killing the captain and two officers as they emerged and making it impossible for the U-boat's crew to get to their big gun and man it. A moment or two later, the trawler opened fire with her 4-inch gun and hit the U-boat repeatedly, many of the shells exploding inside. The Germans managed to get a machine gun into action from the conning-tower and returned the fire, killing the Lady Shirley's gun-layer and wounding five other men. The gun-layer's place was at once taken by the Sub-Lieutenant and the trawler's fire was not checked. In a few moments the Germans ceased fire and held up their hands in sign of surrender. The U-boat sank almost immediately, but forty-five survivors—more than the Lady Shirley's own company—were picked up and made prisoner. One of them died of wounds before the trawler got back to harbour, but the remainder were duly landed. The captain of the Lady Shirley, Lieutenant-Commander Callaway, R.A.N.V.R. was at once awarded the D.S.O.

Another successful action against an enemy submarine—the Italian *Ferraris*, one of those which had escaped from the Red Sea and made the long voyage round to Bordeaux—occurred on October 25. The *Ferraris*, refitted after her long voyage, left Bordeaux on October 10 and after calling at La Pallice started on her first and last operational cruise in the Atlantic. It is not known whether she did any execution in the course of it, for the next report of her was when she was attacked on the surface with bombs by a flying-boat of the Coastal Command. Some of the external fuel tanks having been perforated in this attack, the captain, Lieutenant Filippo Flores, decided not to dive, since the sea was calm and oil leaking from the perforated tanks would have revealed the position of his boat and made depth-charge attack easy. He tried to escape on the surface, but the flying-boat had summoned assistance and two hours later the destroyer *Lamerton* arrived on the scene. The *Ferraris* was quickly sunk by gunfire and six of her eight officers and forty-six of her forty-nine men were rescued and made prisoner.

On the same day that the *Ferraris* was sunk the loss was announced of H.M.S. *Broadwater*, destroyer, torpedoed and sunk while escorting a convoy in some other part of the Atlantic. The day before she was sunk, the *Broadwater* had attacked a U-boat which was considered "possibly sunk." The *Broadwater* was one of the fifty American destroyers transferred to the Royal Navy; she was formerly the U.S.S. *Mason*. She was the first of the ex-American destroyers in the British service to be lost in action.

In the Atlantic Axis aggression against the U.S.A. continued to increase. On October 8 the American s.s. *West Nilus* reported picking up eighteen survivors from the American tanker *J. C. White* sunk by U-boat on September 27, 450 miles east of Recife in Brazil, when bound from Curaçoa to Cape Town. On October 9 President Roosevelt sent a message to Congress recommending that the Neutrality Act should be amended so as to permit the arming of American merchant ships, a recommendation upon which Congress shortly afterwards acted. On October 12 it was announced in Washington that a United States patrol ship had captured, off the coast of Greenland, a small Norwegian ship which had just set up in Greenland a radio station which was working under German control and sending meteorological information to Germany. A similar illicit station was discovered at the same time in Cuba, near the naval base of Guantanamo.

On October 16 the American s.s. *Bold Venture* was torpedoed 500 miles south-west of Iceland. The next day the s.s. *Lehigh* was torpedoed in mid-Atlantic near the Equator, though all her company were eventually rescued. On that day the U.S. destroyer U.S.S. *Kearney* was torpedoed some 350 miles south-west of Iceland. She was able to return to harbour under her own power but eleven of her company were killed and ten were injured.

On October 20 the Government of the Republic of Panama—which is understood to be in very close relations with the United States—authorised the arming of merchant ships flying her flag, of which a large number were owned in the United States. On October 29 the U.S. naval tanker *Salinas*, which was in convoy, was torpedoed south-west of Iceland. The next day the destroyer U.S.S. *Rueben James* was torpedoed and sunk in the same waters. Two of her company were known to have been killed and seven officers and eighty-eight men were missing.

In Home Waters, German and German-occupied ports and the shipping passing between them were attacked continually from the air whenever opportunity afforded, on the average about every alternate day. On October 8 an attack was made by the Fleet Air Arm on German shipping near the Lofoten Islands, probably at a place where all German ships supplying the armies on the north Russian front were obliged to pass through an area of open sea. One 1,000-ton ship was set on fire and the power station on Grond Island was destroyed. Later in the day a 15,000-ton ship was hit and abandoned, and two ships of some 2,000 tons escorted by flak ships were hit off Bodo. The next day aircraft of the Coastal Command bombed ships at Aalesund, between Bergen and Trondheim. A week later, on October 14, three German supply ships were hit by Coastal Command aircraft in the same waters.

On October 18 some of the new Fighter Command aircraft armed with cannon destroyed four minesweepers working off the Belgian coast. On October 29 the Coastal Command made another attack off western Norway, hitting seven ships in Aalesund, one at Statland some 50 miles to the south, and also attacked the docks at Bergen. On October 31 widespread attacks were made on shipping, ten ships in all being hit off Norway and off the Frisian Islands and one off La Pallice in the Bay of Biscay.

Brest and the German warships sheltering there were bombed on October 2, 8, and 29-31.

German attacks on British north-bound convoys were made at intervals throughout the month without much effect. On October 14 the Germans announced that in an E-boat attack the night before they had sunk six ships in a British convoy of a total of 18,000-tons. This probably related to an attack which was really made, but it is practically impossible for E-boats attacking at night to observe what they have achieved. This optimistic account was doubtless issued with the object of provoking a British denial which should inform them what the real result was. If so the object was not attained, for no British account of the incident was issued. It may be confidently asserted that the German account was a gross exaggeration.

In the war between Russia and Germany the Russian Fleet in the Sea of Azov did good execution early in the month against German troops trying to move into the Crimea by the narrow neck of land known as the Arabalskaya Strelka. Odessa was finally occupied by the Germans on October 16, the garrison which had held out so long being withdrawn by

sea. In the Baltic, although the Germans had given the world to understand that they were in full control of the Gulf of Finland, it was reported from Finland that the Russian ships were moving freely between Hangö and Leningrad. On October 21 the Germans announced that Dagö, the last of the Baltic Islands, was then in their hands, captured after an opposed landing on the southern shore. On October 27 the Russians announced that their submarines, working presumably in the Arctic, had sunk four German transports laden with troops.

In the Mediterranean the history of operations is one long story of successful attacks on Italian convoys bound for Tripoli. On October 5 the aircraft of the Fleet Air Arm attacked a south-bound convoy of six ships escorted by five destroyers. Two of the largest ships were torpedoed and sunk, two more were damaged; to what extent is not known. It may be taken that no more than half the forces or supplies carried by that convoy reached the African harbour for which it was bound; and that a certain part of what reached the harbour was probably destroyed in the air attacks which were constantly being made on it throughout that period. That result is probably typical of all the Axis supplies to Libya in that period.

On October 7 the recent exploits of a number of British submarines were published. One of them sank one of the 635-ton torpedo boats of the "Generali" class and a 3,500-ton supply ship. A sailing ship laden with Italian troops and what was described as a guard-ship were also sunk. By one submarine a 6,000-ton tanker was torpedoed, set on fire and probably sunk; by another the 5,900-ton tanker Liri was torpedoed and seriously damaged. By a third two 5,000-ton transports and three supply ships were torpedoed.

On October 8 the Fleet Air Arm torpedoed and sank a 6,000-ton supply ship. Two days later they attacked a convoy consisting of four ships, one of which was a tanker, escorted by five destroyers and aircraft. In the first attack three ships were torpedoed; two of them were set on fire and were almost certainly sunk, while the third though hit went on with the convoy. Bombers of the R.A.F. then took up the attack and made more hits, but the bad weather, high wind and low clouds made it impossible for the definite results of this attack to be ascertained, or those of the Fleet Air Arm which resumed the attack the next morning.

On October 14 more submarine exploits were announced. One British submarine attacked two supply ships, one of which was sunk and the other driven ashore. A Dutch submarine torpedoed and sank a 3,500-ton supply ship. On the same day the Italians announced that their torpedo aircraft had made hits on a British battleship and a 10,000-ton cruiser. It is quite true that such an attack was made on the British fleet not far from Alexandria, but the hits were fictitious; all the torpedoes missed. It was evidently the habit of the pilots of Italian torpedo aircraft to report hits with every torpedo they dropped.

On October 17, the Fleet Air Arm made another attack on a convoy, hitting two medium-sized supply ships and one smaller ship with torpedoes. The results were not ascertained. The same day the aircraft of the R.A.F. bombed Elmas in Sardinia. The next day the attack on the same convoy was resumed and the largest ship in it was hit by three torpedoes and burst into flames, and another ship was probably hit. On October 21 the Italians admitted that two of their torpedo boats had been sunk in the central Mediterranean probably by mines. On October 22 another

submarine report was issued. Two ships bound for Libya had been torpedoed, both of them being sunk, while another submarine bombarded the airfield at Appollonia, near Derna, doing severe damage to the buildings. Two days later the torpedoing by another submarine of the Italian armed merchant cruiser *Citto di Genova* was reported.

Benghazi and Tripoli were bombarded on every possible day, some fifteen or sixteen times during the month. Naples was bombed six times and the Piræus, then in full use by the Axis Powers, twice. As before the airfields and seaplane stations in Sicily were the target for frequent attacks.

Besides the loss of the *Broadwater*, already recorded, those of the corvettes *Fleur de Lys*, and auxiliaries *Corfield* and *Spring Bank* and of two trawlers was announced during the month.

NOVEMBER

No definite news was made public about the losses of shipping during the month, but from announcements made later it is clear that they must have continued to diminish satisfactorily. At the same time there were indications of the extension westward of the area of U-boat activity. Mr. McDonald, Canadian Minister of the Navy, stated in a speech on November 5th that two U-boats had recently been attacked north of Newfoundland and in the Straits of Belle Isle. There were many U-boats between Belle Isle and Iceland and they had been operating within sight of the shore of Newfoundland. They were of course being vigorously counter-attacked by the Royal Canadian Navy and Air Force. Later in the month it became known that the largest convoy of the whole war carrying Canadian troops had safely crossed the Atlantic and arrived in England to complete the 5th Canadian Armoured Division.

On November 4 the Admiralty announced that a total of 1,276 officers and men had been rescued from German U-boats and Italian submarines which had been destroyed and were held as prisoners-of-war. Of these number, 467 were Italians. This figure did not of course give any definite clue to the total number of enemy submarines destroyed. Of the many U-boats sunk it was from some of them only that there were survivors, and it is not possible for anyone not in the secrets of the Admiralty to form an estimate of the proportion. Moreover survivors vary in number from almost the full company of between forty and fifty of the large U-boats to as low as one or two in certain cases. It was, nevertheless, encouraging to learn that the number of submarine prisoners was so substantial.

No further sinkings by Axis U-boats or raiders of American ships were reported during the month, but one incident in which the United States were concerned did occur. The German motor ship *Odenwald*, flying the United States colours and with the U.S. flag displayed on her deck and on either side of her hull, was encountered at sea by a U.S. cruiser. The cruiser ordered her to heave to, lowered a boat and sent an officer to board; whereupon the *Odenwald* hoisted a signal "Send boat for passengers I am sinking." Immediately afterwards two explosions were heard on board. The cruiser put a salvage party on board who were able to deal with the damage caused by the would-be scuttling and the ship was kept afloat. She was taken into an American port and since, under the United States law, the ship was liable to confiscation for illegally disguising herself as American, legal steps were at once taken to that end.

On November 22 H.M.S. Devonshire sighted a merchant vessel stopped somewhere in the South Atlantic. An examination by the Devonshires' aircraft before the cruiser came to close quarters revealed a boat lying off the ship containing oil drums, and in general appearance the ship was noticed to be very similar to one of the German armed merchant raiders. H.M.S. Devonshire interrogated the ship by signal, to which no satisfactory replies were received, and as this confirmed the hostile character of this most suspicious ship, fire was at once opened. In ten minutes, in spite of an endeavour to escape behind a smoke screen, the ship was set on fire. Her crew abandoned ship in their boats and shortly afterwards her magazine exploded and she sank.

The circumstances observed when the ship was first encountered clearly indicated the presence of a U-boat in the act of refuelling from the ship's boats which were carrying oil drums. In these circumstances H.M.S. Devonshire did not, of course, disclose the position of the sunken ship, since to do so would have been to offer herself as the target to the U-boat. The presence of the latter moreover relieved the Devonshire of any obligation to take steps for the rescue of the raider's crew. That obligation rested upon the U-boat. Often and often captains of U-boats have displayed callous disregard of any humanitarian obligations towards the crews of ships of other nationalities that they themselves have sunk. Whether their behaviour towards the survivors of one of their own ships was any better is not known.

On November 27 a German announcement claimed that H.M.S. Dragon, cruiser, had been torpedoed in the South Atlantic by a U-boat. When it was denied that H.M.S. Dragon had been lost, the claim was amended to read "A cruiser of the 'Dragon' class". It was soon afterwards established that the latter report was true, and that the ship concerned was H.M.S. Dunedin. There were over 300 casualties, only four officers and sixty-three ratings being later picked up.

In Home Waters the attacks on German ports and those in occupied countries and the shipping passing between them were continued without intermission. Brest and the German ships still sheltering there were again the target on November 24 and 26. On November 2 a fish-oil factory in Norway which was working for the Germans, and a wireless station near it, were bombed and set on fire by aircraft of the Coastal Command.

On November 10 the melancholy news was announced that the famous destroyer Cossack had been sunk. It was not known whether her loss was the result of striking a mine or of being torpedoed by a U-boat, nor where it actually occurred; but it was described later how an explosion occurred forward which caused many casualties amongst the officers on the bridge and started a fire which spread rapidly by reason of the high wind. The Cossack was perhaps one of the best-known destroyers in the Navy since she first came into the news for the rescue of the British merchant seamen from the German prison-ship Altmark. She took a prominent part in the second battle at Narvik where she was considerably damaged—a photograph of H.M.S. Warspite seen through a shell hole in her side appeared in last year's "Brassey." On October 13, 1940, she was the ship of the Senior Officer, Captain Vian, of a flotilla of four destroyers which completely wiped out an enemy convoy of three supply ships escorted by two sloops. Throughout the night before the Bismarck sank it was again Captain Vian's flotilla with the Cossack that shadowed and attacked her. She was the fifth ship with her name in the Royal Navy.

A British raid on the European coast was made during the month. It was on a small scale and took place on the night of November 23. The patrol which was landed returned intact after carrying out its mission, the only casualty being one man wounded by a machine gun bullet. The German account, however, stated that British troops attempting to land by small boats were repulsed with very heavy losses inflicted by the German shore defences.

British light forces in Home Waters were twice in the news during the month. On the night of November 6 they intercepted a large enemy supply ship which was strongly escorted, and torpedoed her so that she had to be beached. At the same time they engaged the enemy escort and it was believed inflicted severe damage on them. One British motor-boat was damaged and the casualties were one officer and four ratings wounded. The action was described by a Petty Officer who was one of the wounded, who stated that the British ships ran up between the two lines of German escorts, trawlers on one side and E-boats on the other, engaging them both, while their return fire was hampered by the danger of hitting their own consorts.

The second action took place on November 19. Shortly before midnight E-boats which attempted to attack a British convoy were driven off by the convoy's escort, two of them being reported "probably sunk." Early the next morning, two British light craft on patrol encountered six E-boats, engaged them for half an hour, sank one and severely damaged others. There was minor damage to one British craft but no casualties. Later the survivors of the E-boats were located and attacked on their return towards the enemy coast by fighter aircraft of the R.A.F. By them yet another E-boat was sunk and another damaged.

On November 29 a description was issued from the Admiralty of the exploits of H.M. Submarines *Tigris* and *Trident*, in attacks on German supplies going by sea to Murmansk. The *Tigris* in the course of the prolonged cruise had sunk five enemy ships and torpedoed a sixth, which may have survived. She also sank two out of a convoy of three supply ships which were strongly escorted. The *Trident* in the same period successfully attacked seven enemy transports or supply ships. Of these, three were seen to sink and it was considered very unlikely that the other four could have survived. An eighth enemy ship was attacked and damaged by gunfire. At least two of the ships sunk were known definitely to be transports laden with troops.

Very little news of the sea war between Russia and Germany came in during the month. It was announced on November 28 that Soviet submarines cruising off enemy shores had sunk a German oil tanker and five transports. It was assumed that these operations also took place in the Arctic although their location was not mentioned in the Russian announcement.

In the Mediterranean the most important event of the month was a highly successful attack on an Italian convoy, in which the whole convoy was wiped out, by a force of two cruisers, under Captain Agnew of the *Aurora*, and two destroyers. The convoy consisted of 10 supply ships strongly escorted by Italian destroyers and covered by two 10,000-ton cruisers of the "Trento" class. Despite the disparity of force Captain Agnew ignored the Italian heavy cruisers and attacked the convoy; nine of the ten ships were sunk outright and the tenth, a tanker, was set ablaze—as she was seen to be still burning ten hours later, it is practically

certain that she too was destroyed. Two destroyers of the escort were sunk and two others seriously damaged ; one was seen to be in two the next day. Of the remainder, another encountered a British submarine the next morning and was also sunk. From the published account it seems that the Italian big cruisers took little or no part in the action, but no explanation has yet been forthcoming of their inactivity. It was perhaps fortunate for them that Captain Agnew was so much occupied with the destruction of the convoy—that task in the circumstances was of the first importance by reason of the assistance it would be to the operations of the army in Libya—that he was unable to attend to them. No doubt they owe their survival to that circumstance.

This exploit was repeated on a smaller scale a fortnight later when surface patrols in the central Mediterranean sank two supply ships escorted by two destroyers. The composition of the British force was not reported on this occasion ; it could hardly have been Captain Agnew's whole force since the destroyer escort succeeded in making good its escape.

Naples was bombed nine or ten times in the course of the month. This also was part of the campaign against supplies for General Rommel's forces going to Libya, many of which were being embarked at that port. Attacks on Benghazi and Tripoli from the air were also frequent, as were those on Augusta and the aerodromes in Sicily.

On November 6 a report of the sinking by submarines of three supply ships in escorted convoys was reported. On November 11 the destruction of four troop or supply ships, and two sailing vessels was reported, with severe damage to two armed merchant cruisers which were escorting convoys, and two other supply ships. On November 21 a submarine report included the torpedoing of the Italian 5,000-ton tanker *Tampico* and a German supply ship.

On November 23 an account was issued of an attack by a British submarine on an Italian force of three cruisers and three destroyers in which hits were made with torpedoes. It was not possible for the submarine to observe the result but subsequent air reconnaissance reported only two cruisers visible and a large area of sea thickly covered with oil fuel, from which it was concluded that the third cruiser had been sunk. The submarine also hit a destroyer with two torpedoes and it is unlikely that the destroyer could have survived that damage. At another period in her cruise the same submarine had torpedoed two enemy supply ships. An announcement issued the same day described also an attack on a south-bound convoy, which was escorted by a cruiser and five destroyers, by aircraft both of the Fleet Air Arm and of the R.A.F. The cruiser was hit by one torpedo as was one large merchant ship in the convoy. A bomb attack from the R.A.F. followed but the results were not observed.

On November 14 Admiral Sir Andrew Cunningham held a press conference in Egypt in which he said " I don't think we have yet sunk enough ships actually to prevent the enemy from starting a western desert offensive but we most surely have delayed it." The Admiral was not perhaps being entirely candid in these remarks, for less than a week later General Auchinleck's advance westward began which once more captured Benghazi and the whole of the province of Cyrenaica. Before the advance started the whole garrison of Tobruk which, from the time of the British withdrawal to the Egyptian frontier in April, had consisted of an Australian Division, was relieved. In August the withdrawal of the Australians and

their replacement by British troops began; it was completed at the beginning of November.

During the month German U-boats made their appearance in the Mediterranean, signalling their arrival by torpedoing the Spanish s.s. *Castello Oropesa* inside Spanish territorial waters off Melilla on November 8. As Axis propaganda represented this outrage to be the work of a British submarine, the British Government at once issued a statement that no British submarine had been within a hundred miles of the position at the time it took place.

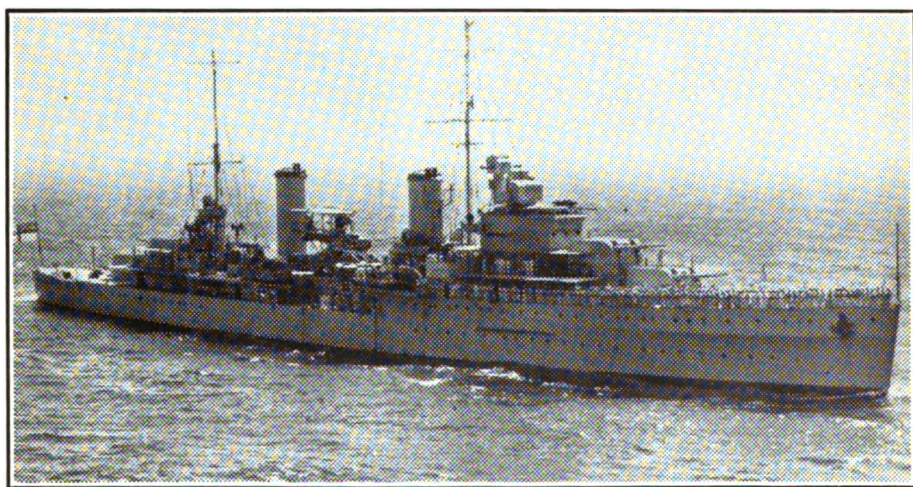
A greater success was made by another U-boat which succeeded in sinking with a torpedo the famous aircraft carrier *Ark Royal*. She was hit at 4.30 p.m. on November 13 when returning to Gibraltar after a cruise in the Mediterranean. It seems probable that she was hit by more than one torpedo, since she at once took a heavy list. Her electric supply was put out of action, thus making it very difficult to deal with the damage. It was dealt with however, the ship was taken in tow, and it was hoped to get her into Gibraltar where she could be docked and repaired. At 4.30 a.m. on November 14, twelve hours after she was torpedoed, the list increased seriously and it became necessary to abandon ship. She sank two hours later when only 25 miles from Gibraltar. Fortunately there was only one casualty.

On November 25 there was an even more serious loss from U-boat attack. The Mediterranean Battle Fleet consisting of the *Queen Elizabeth*, *Barham* and *Valiant*, was at sea off the Egyptian coast engaged in exercises. The battleships were steaming at 17 knots and were in the act of altering course together when at 4.25 p.m. a U-boat about 700 yards from the *Barham* was sighted from the *Valiant*. The U-boat was observed to fire torpedoes, probably four or more together, all of which were believed to have hit the *Barham*. The result must have been to lay open most of her side under water, for in less than five minutes she had rolled over on her side and her magazine exploded. She sank at once. Only some 300 out of her complement of 1,150 were saved. Vice-Admiral Pridham, Wippell, whose flagship she was, was picked up but Captain Cooke who commanded her was not saved.

The U-boats had just brought to their hard-pressed Italian Allies substantial assistance, but not without cost. A number of them were destroyed during the month, and of those, the circumstances of the destruction of two were made known later. On November 16, three days after the loss of the *Ark Royal*, U.433 was destroyed in the same area by H.M.S. *Marigold*, corvette. U.433 was not the boat which torpedoed the *Ark Royal*, but it seems probable that she was working in collaboration. She was a 500-ton boat commanded by Lieutenant-Commander Ey, aged 26, an experienced U-boat commander. She had made one operational cruise before that one in which she was sunk, but it was entirely unsuccessful. She left St. Nazaire on November 9 and passed through the Straits of Gibraltar at night four days later. She had made no attacks on any ships when on the night of November 16 she was sighted at about a mile off by H.M.S. *Marigold*, which was taken by Lieutenant Ey for a light cruiser. The *Marigold* attempted to ram, and when the U.433 avoided that manœuvre by a crash dive, attacked with depth charges which were not near enough to do any serious damage. She continued to hunt, however, and half an hour later made another depth charge attack which brought the U-boat to the surface, where she was promptly sunk by the *Marigold's*



H.M.S. Ark Royal, damaged by a U-boat's torpedo, November 13, 1941.
(British Official photograph.)



H.M.A.S. Sydney, lost in the Indian Ocean, November, 1941.
(British Official photograph.)

gunfire. The Commanding Officer and thirty-seven out of his forty-three men were picked up from the sea and made prisoners.

The second U-boat of which the destruction has been described was U.95, commanded by Lieutenant-Commander Schreiber. She had left Lorient on her seventh operational cruise on November 16, passing the Straits of Gibraltar on the night of November 24. She, too, was unable to bring off any attacks in the Mediterranean, and on the night of November 28, which was calm and moonlit, she was on the surface not far from Gibraltar when she was sighted and torpedoed by a Dutch submarine. The U-boat was practically blown in two and sank within five or six seconds, the only survivors being four officers and seven ratings who had been on the bridge, and one rating who was in the conning-tower, and who was blown up through the hatch by the force of the explosion.

Dutch were not the only Allied submarines which were collaborating in the Mediterranean. On November 11 the Greek submarine *Glaukos* sank an enemy supply ship off the coast of Crete.

In the Indian Ocean early in the month, a French convoy of five merchant ships, with the token escort of the sloop *D'Iberville*, was proceeding from Madagascar towards Dakar and thence probably destined for France. It was sighted 200 miles off Durban by patrols of the South African Air Force and was intercepted by a force of H.M. ships and ships of the South African Seaward Defence Force. In order that the right of visit and search might be exercised, the French Senior Officer was requested to direct the convoy to proceed into port. The request was refused. Boarding parties were then sent to the merchant ships to enforce compliance, whereupon a determined attempt was made by their companies to scuttle their ships, quite in the style of their German masters. The attempts were frustrated by the boarding parties and the ships were taken into harbour.

A vigorous protest was at once made by the Vichy Government alleging that the ships contained only food supplies for France and not war material. This was disproved when examination was made, and it was reported later that their cargoes were found to include leather, hides, tanning material, and graphite, all of which the Germans were well known to be very short of. In any case the refusal to submit to examination was obviously entirely disingenuous. The right of examination is universally admitted, and had always been exercised by France herself when a belligerent. If the ships were *bona fide* innocent there could be no reason for objecting to the fact being verified by British naval authorities. The incident clearly illustrated the desire of the pro-Axis party in France to manufacture a grievance against this country.

On November 19 it became known that H.M.S. *Prince of Wales* and other ships had called at the Cape. Though no announcement was then made it was generally concluded that she was bound for the Pacific, in accordance with the Prime Minister's announcement, made on November 10 that a powerful force of heavy ships was being provided for service if needed in the Indian and Pacific Oceans.

There the war clouds were ominously lowering. The Japanese envoys were, it is true, in Washington and carrying on discussions and letting it be known that they hoped to reach a peaceful solution to the matters at issue between America and Japan. But apparently little real progress towards a peaceful solution was being made. On November 4 it was reported that American women were leaving the islands of the Pacific.

On November 7 it was announced that the President was considering the withdrawal from China of the scattered garrisons of U.S. Marines, and on November 14 their withdrawal was ordered to take place. On November 27, the first contingent of U.S. Marines left Shanghai for Manila. On November 30 a powerful Japanese Fleet was reported to be in the vicinity of the Japanese mandated islands of the Pacific.

Besides the loss already chronicled, those of the minelayer *Latona* and of the corvette *Gladiolus* were reported during the month.

DECEMBER.

In December the centre of gravity of the war shifted for the time being to the Pacific and the Far East, but the arrangement of this chronicle adopted hitherto will be retained for this month.

In the Atlantic and in the seas generally the shipping losses continued to be kept down satisfactorily. On December 31 the Prime Minister in a speech at Ottawa stated that the losses for the last five months had been only one-fifth of those in the five months before that. It is not quite clear whether this statement included the losses for December or not, but assuming that it did not it indicated that the monthly average from July to November inclusive had been under 100,000 tons, which on the whole must be considered a very satisfactory figure. In December, however, the total shipping losses were swelled by all the British and Allied ships captured in the Far East and in the Pacific harbours by the Japanese, as well as the merchant ships lost in the operations in Hong Kong, Malaya, and the Indies. The total losses therefore must have been considerably greater than those in the earlier months.

America's entry into the war came on December 7. But on December 21 Colonel Knox, the Secretary of the Navy, announced that already fourteen U-boats had been destroyed in the Atlantic by the United States Navy. Looking at this statement with the experience of later months, it seems possible that the figure may perhaps have been reached through undue optimism regarding the result of some attacks which did not provide apparently definite evidence of success. That at least was our own experience at the outset of war, so it was not unlikely in the case of the United States.

The efficacy of British convoy defence was well illustrated by the story of an episode of this period. On December 22, the Germans claimed to have sunk in the Atlantic by U-boat attack on a convoy, nine merchant ships, totalling 37,000 tons, together with an aircraft carrier of the *Formidable* class. This is what really happened. A convoy of over 30 merchant ships was crossing the Atlantic towards the United Kingdom. On December 17 torpedoes were fired at the convoy by U-boats. Counter-attacks by the escort damaged one of them, U.131, disabling her motors and cracking her hull so that she was only just able to struggle to the surface for her company of 48 officers and men to escape. As she broke surface she was at once sunk by gunfire from the escort. Later in the day two Focke-Wulf bombers approached the convoy to attack, but before they could do so they were engaged and driven off by Hurricane fighters from the auxiliary H.M.S. *Audacity*—the ex-German merchant ship *Hanover*, which had been fitted to carry and catapult fighters. The next day U-boats returned to the attack, but again the counter-attack by the escort damaged U.434. Her fate was precisely similar to that of U.511,

she just managed to surface and all her crew of 44 officers and men, with the exception of one officer and one rating, were picked up and made prisoners before she was sunk by gunfire from H.M.S. Stanley—ex-U.S.S. McCalla. The next day, December 19, three Focke-Wulf bombers came in to attack. Again H.M.S. Audacity's aircraft met them, shot down two of them and damaged the third seriously, driving it off. On that morning another U-boat, U.574, which had lost touch with the convoy when driven away by the counter-attack in which U.131 was sunk, came up with it again and fired torpedoes, one of which hit and sank H.M.S. Stanley. U.574 was at once counter-attacked by H.M.S. Stork and severely damaged by her depth charges. Her lights were extinguished, her compressed air bottles and even the main hull frames were fractured, but her commanding officer, Lieutenant Gengelbach, refused to bring her to the surface to allow the crew to save their lives. It was only after a heated altercation that he was forced by the crew to give the order to blow the tanks. As she reached the surface the crew abandoned ship; at that moment she was rammed by H.M.S. Stork, which rolled her over so that she sank. Only four officers and 12 ratings out of her total complement of 43 survived. Lieutenant Gengelbach was not amongst them. The U-boat attacks continued for two more days during which the Audacity was torpedoed and sunk; counter-attacks continued just as relentlessly, aided by the flying-boats and other aircraft of the Coastal Command, the area of operation of which the convoy by that time had reached. No more U-boat prisoners were taken but there is good reason to believe—though in default of definite evidence no positive claim was made—that some U-boats were actually sunk. In all these attacks the enemy succeeded in sinking only two ships of the convoy, of total tonnage 6,193.

On December 8 H.M.S. Dorsetshire destroyed a raider in circumstances very similar to those of the Devonshire in November. Her aircraft sighted a German disguised merchant-ship raider of about 10,000 tons, lying stopped well out in the South Atlantic, with five of her boats in the water alongside of her. The boats were obviously engaged in supplying a U-boat. On the Dorsetshire's approach the raider immediately made off leaving the five boats behind her. Whereupon the Dorsetshire promptly sank her, leaving the U-boat to attend to her survivors.

Before this incident another German raider, the Kormoran, had been destroyed, this time in the Indian Ocean some 300 miles west of Australia; but her destruction was unfortunately accompanied by the loss of the famous Australian cruiser Sydney. The circumstances of the action are only imperfectly known, for there were no survivors from the Sydney, and the story had to be pieced together with those told by the survivors of the German ship. It appears that, when the Sydney located the Kormoran, for some reason she was unable to use air reconnaissance from a distance; but she evidently recognised her assailant's character, for although she closed she was ready for action, and when the raider disclosed herself both ships opened fire simultaneously. The raider was heavily armed with 6-inch guns and her first salvo hit the Sydney's bridge, probably killing the captain and officers on it and putting the primary gun control out of action. It certainly started a fire which continued to burn throughout the action. The Kormoran, however, was disabled by a hit in the engine-room and was also set on fire, so that her company were obliged to cease fire and abandon ship; she shortly afterwards blew up and sank. Her survivors saw the Sydney disappear over the horizon still burning and that

was the last that was known of her. It seems certain that the fire must have spread to her magazine and that she must have perished in the explosion which followed; for although a diligent search was made over a very wide area nothing more could be found. Three hundred and thirty survivors from the *Kormoran* were landed and made prisoner in Australia.

A large German tanker was sighted in the Atlantic in the morning of December 23 by a flying boat of the Coastal Command. The flying boat at once attacked with bombs and the tanker began to leave a wake of oil. The crew believed that the tanker had been engaged in fuelling a U-boat at the time of the attack, but it does not appear that this was established. The tanker was pursued by other aircraft of the Coastal Command and was located again the following morning by a Catalina flying boat which summoned bombers to attack again, though if any damage was done it does not seem to have been serious enough to stop the ship. However, that evening when she was nearing the north coast of Spain she was hit by a torpedo dropped by a Beaufort aircraft and thereby set on fire.

In Home Waters the bombing of shipping off the occupied coast continued whenever weather permitted. On December 3 the dry docks and ships in them at Christiansund were bombed by aircraft of the Coastal Command, which also set a supply ship on fire the following day. Similar attacks off the French, Norwegian, and Dutch coasts were made on December 5, 7, and 9, as well as on frequent days later in the month. A flak ship was sunk by torpedo off the Dutch coast on December 16 and the naval base at Wilhelmshaven was bombed that night.

Air attacks on Brest and the German ships there began again on a large scale on the 15th–18th both by day and by night. A number of photographs taken on December 18 during the attacks seemed to show that—in the words of the Air Ministry News Service—"It is one of the most remarkable instances of accurate bombing under heavy fire." Both the *Scharnhorst* and *Gneisenau* were in dock, and not only did it appear that heavy bombs had fallen actually in the docks in which the ships lay, but also it was believed that one dock gate had been put out of action. It was not claimed, however, for certain that the ships were hit, and in view of subsequent events, in spite of the alleged great accuracy, it seems clear that the damage to them and to the docks must have been overrated.

Towards the end of the month the port of La Pallice was again bombed. The particular object of this attack was not explained.

On December 29 a remarkably well-planned and well-executed raid was made on the port and anchorage of Vaagsö by contingents from all three Services, working under the organisation and command of an institution known as Combined Operations Headquarters. Vaagsö is a small port between Bergen and Trondheim which was used by the Germans as an assembly point for convoys for supplies going north. The town of the name is situated on the inshore side of the island and the convoy anchorage was in the strait between the island and the mainland. This anchorage was entered from a fjord to the south of the island, the entrance being protected by batteries established on a small islet lying in the centre of the entrance. The approach to the entrance was commanded by a heavier battery mounted on the mainland, and firing straight down the fjord up which any ships entering must come.

The co-operation and timing of the parts taken by the three Services were perfect. The R.A.F. first laid a smoke screen masking the heavy battery just mentioned, so that the warships, and the craft carrying the

army contingents could enter unharmed. The R.A.F. at the same time bombed the nearest airfield at Herdla, 100 miles to the southward, whence interference might have come if the enemy aircraft were not kept on the ground ; and they provided fighter protection overhead, to deal with any air interference coming from more distant enemy airfields. The army first landed on the islet and overpowered the garrison and put the light batteries out of action. Directly afterwards they landed on Vaagsö island and seized the town itself, against some determined opposition by small German forces, taking possession of all means of communications and the German convoy headquarters. The Navy having covered the landing of the Army assisted them when needed by fire and destroyed five merchant ships assembled ready for a convoy. The whole operation went like clock-work. The only departure from the programme was that the landing started at 8.26 instead of at 8.30 as arranged.

The re-embarkation took place a quarter of an hour earlier than had been arranged, the whole of the objects being by then attained. Casualties were very small. A number of German prisoners were brought away together with all the quislings in the place, and passage was given to any Norwegian volunteers who wished to come to England to fight with their compatriots. Press correspondents and a film unit accompanied the force, and the whole operation was witnessed in London on the news reels within a few hours of the return of the forces engaged.

In the war between Russia and Germany the enemy's advance through the Crimea and north of the Sea of Azov towards Rostov continued until Rostov was nearly reached and the enemy held the whole of the Crimea except Sevastopol. The Russians retained their hold on that port, their principal naval base, and thus retained complete control of the Black Sea, so that the Germans were unable to cross the Straits of Kertch. But towards the end of the month, the Russians were able to cross it in the other direction and to make a landing at Theodosia on the south shore of the Crimea, driving back the Germans from there and from most of the Kertch Peninsula.

In the Mediterranean, on December 1, Captain Agnew in the *Aurora* did some more remarkably effective execution against the enemy communications across the central Mediterranean. A surface force under his command intercepted the 1,976-ton supply ship *Adriatico*, laden with artillery, stores, and ammunition for Libya, and sank her, rescuing some survivors. Later in the day they intercepted the tanker *Manovani*, 6,500-tons, which was escorted by the large destroyer *Alvise da Mosto*, and at once attacked them. The destroyer blew up and sank ; the tanker, which was loaded with some 10,000 tons of fuel for Libya, chiefly petrol for aircraft and tanks, was also sunk, some survivors being picked up from each. There were no damage or casualties to the British force.

An announcement issued from R.A.F. Headquarters two days later—apparently an afterthought—seemed to imply that these ships had been previously disabled by R.A.F. bombers. This seemed to indicate a lower standard of inter-service collaboration in the authority charged with publicity than was attained in actual operations ; but any controversy over this matter would, of course, have been mischievous and no more was heard of it.

An even more noteworthy exploit perhaps was achieved when just before dawn on December 13 four destroyers, *H.M.S. Sikh* (Senior Officer, Commander G. H. Stokes), *Legion*, *Maori*, and the Dutch destroyer *Isaac*

Sweers, met and attacked with guns and torpedoes an Italian force of two cruisers, a torpedo-boat, and an E-boat. Both cruisers were set on fire, one blew up and the other was left burning, the torpedo-boat was damaged and the E-boat sunk. The second cruiser, it was later admitted by the Italians, sank later. Again there were no damage or casualties in the Allied force.

It has been the practice of the Italian Command when some naval loss had to be admitted, to announce as an offset—presumably for the benefit of Italian moral—striking successes against the British Navy. In accordance with that practice the Italian announcement which admitted the loss of these two cruisers stated that a Dutch destroyer had been sunk in the action and that an Italian submarine had sunk two British cruisers. There was no basis for either of these two claims.

On December 16 aircraft of the Fleet Air Arm in the same waters torpedoed a south-bound merchant ship escorted by a destroyer and sank it. Two days later they hit with torpedoes two ships out of a convoy of three in the same waters, and that night the R.A.F. attacked the Italian Fleet in harbour at Taranto with bombs.

Submarine activity in the same area continued unabated. On December 12 the Admiralty announced that a British submarine in the central Mediterranean had attacked three Italian cruisers which were steaming south at high speed screened by destroyers. The conditions were very difficult for the submarine, for the light was failing and there was a rough sea. Nevertheless three torpedo hits were obtained, though it was impossible to observe which enemy ships were struck. Soon afterwards a heavy explosion was heard which seemed to indicate that the magazine in one of the ships hit had exploded. It thus seemed probable that at least one of the enemy cruisers was sunk, though it is impossible to say definitely that it was not a destroyer.

On December 15 further exploits were described. A medium-sized supply ship, a schooner, and a caique had been sunk by gunfire; a supply ship and a salvage tug had been sunk by torpedo inside Candia harbour in Crete; two supply ships screened by destroyers had been torpedoed; one of the Ramb class of fast merchant ships, which were all in Italian Government service, was torpedoed and the 12,000-ton liner *Virgilio*, which was escorted by torpedo craft, was torpedoed and sunk. On December 23 the sinking of six more transports or supply ships by British submarines was announced, and on December 31 a statement was issued that another submarine had sunk five enemy schooners laden with ammunition or military stores and had torpedoed a destroyer.

On December 12 the London Gazette announced the award of the Victoria Cross to Lieutenant-Commander Wanklyn, commanding the submarine *Upholder*, for sinking on May 24, 1941, a strongly escorted transport in most difficult conditions. The light was failing so that it was very difficult to see anything through the periscope; his listening apparatus on which a submarine depends largely for manoeuvring so as to escape counter-attack, was out of action. But Lieutenant-Commander Wanklyn was not deterred by all these handicaps and sank his quarry. Five days later a number of awards were announced to both officers and men of the submarines *Upholder* and *Urge* from which it may be deduced that many of the submarine exploits described during that period were the work of those two boats.

On December 17 the Italian submarine *Ammiraglio Caracciolo* was

sunk by British ships and 53 officers and men were taken prisoner. At least two German U-boats were sunk in the same period, some 40 prisoners being taken from each, the successful ships in this exploit being the destroyers Farndale, Kipling, Hasty, and Hotspur. At the same time the Italians announced that one of their submarines, which was stated to have 22 British officers prisoner on board, was overdue. If the statement was true it would seem to indicate that the Italians regarded a submarine as being the only safe method of conducting communications between Italy and Libya.

On December 19 the Germans announced that one of their U-boats had sunk a British cruiser of the Leander class off Alexandria. This announcement may possibly have related to the loss of H.M.S. Galatea, torpedoed and sunk by a U-boat, which was announced by the Admiralty on January 10.

Air attacks on Italian ports were not neglected, but they were less frequent during December than they had been in earlier months.

On December 9 the French Government at Vichy issued a statement that the French merchant ship St. Denis, carrying food for France and flying the French flag, had been torpedoed near the Balearic Islands by a British submarine. On December 16 the Admiralty issued a statement that no British submarine was in or passing through that area at that time, and pointed out that on December 15 a German U-boat which made no secret of its identity had been operating in the vicinity and had actually sunk the Spanish s.s. Badalona; and that other U-boats had been guilty of similar outrages at about the same time. The French charge was withdrawn two days later.

PACIFIC.

On December 1 Admiral Sir Tom Phillips arrived at Singapore, and his appointment was announced as Commander-in-Chief of the Eastern Fleet; superseding Vice-Admiral Sir Geoffrey Layton, who up to then had been Commander-in-Chief of the British China Station. On the same day a state of emergency was declared both in Singapore and in Hong Kong. The next day H.M.S. Prince of Wales and Repulse arrived in Singapore together with some other lesser ships, the number and names of which have not been made public.

The diplomatic conversations in Washington were proceeding at this period and the published accounts of their progress from time to time seemed to indicate the probability of a satisfactory understanding being reached between Japan and the United States whereby peace would be preserved in the Pacific. It would seem, however, that the general impression to this effect was misleading.

On the morning of December 7 the Japanese attacks were made on Pearl Harbour and Manila and the Japanese forces seized control at Shanghai. The Pearl Harbour attack is described very fully, in the words of the United States Investigating Commission, in Chapter V. It is therefore unnecessary to write more about it here except to remark that the immediate effect of it was to a large extent to immobilise the United States naval forces in the central Pacific. At Manila the naval base at Cavite, the army stations, and particularly the airfields throughout the Philippines, were heavily attacked from the air. Guam, the United States naval base in the Mariana Islands, was bombed. The Shanghai International Settlement was occupied at dawn by Japanese troops, the U.S.

river gun-boat Wake was taken into Japanese possession, and the Japanese flagship Idzumo opened fire and finally sank the British gun-boat H.M.S. Peterel, which was lying in the anchorage. Presumably, although details do not appear to have been made public, the Japanese seized all British and Allied merchant vessels within their reach. At the same time Japan declared war on the United States and the British Empire, thus abruptly determining the Washington conferences.

Of the invasion of the Philippines there is very little of naval interest to relate. The United States Asiatic Squadron was so small that it could not hope to have very much effect in face of the naval forces that Japan was able to bring against it. It would therefore seem to have been withdrawn—though, of course, no announcement of its movements was made—probably to join the other Allied forces in Australian or East Indian waters, leaving it to air forces and light craft to provide what opposition they could to the Japanese sea-borne invasion. The American Air Force succeeded in sinking the Japanese battleship Haruna off the north coast of Luzon on December 11, and damaging another battleship of the same class the next day. On December 11 the Japanese claimed to have sunk an American destroyer and submarine in Manila, though it is not known if the claim was justified. On December 17 U.S. submarines were reported to have sunk a Japanese transport and destroyer somewhere in Philippine waters. It would not seem, however, that the American forces in the Philippines were able to make any effective opposition to the Japanese at sea, and it was estimated soon after the invasion started that they already had nearly 100,000 men—six to eight divisions—in the island of Luzon. They were obviously very well practised in the manœuvre of landing troops from the sea on open shores, for which purpose they used special boats carrying some 150 men each. This proficiency held them in good stead, particularly from the time that they enjoyed complete control at sea.

Guam fell to the Japanese attackers very soon. The small garrison of United States Marines at Wake Island held out for 14 days and before it was overpowered succeeded in sinking a cruiser, three destroyers, and a submarine of the strong Japanese forces which were attacking; Midway Island repulsed all attacks. With this brief summary of American sea actions we may turn to the British part in the Pacific war.

On December 8 the day after Japan threw off the mask, the Japanese invasion of Malaya started at the north, across the frontier from Siam. It would seem that Japanese forces from Indo-China and probably also from other parts of Siam crossed by sea to the Siamese shore of the Kra Isthmus and landed there before attacking Malayan territory; but as soon as the invasion had started and some progress had been made, further forces were sent to land on the north-west coast of Malaya itself.

On December 9 Admiral Phillips sailed from Singapore with his flag in the Prince of Wales with the Repulse and some destroyers in company. The precise composition of his force has not been disclosed in greater detail than that. He signalled to his ships that he hoped to evade observation that day and to engage Japanese transports approaching the shore of Malaya to land troops the next morning. They might be supported by the old Japanese battleship Kongo. In any case air attack, for which his ships were to keep a sharp look out, was a possibility. During the day the force was sighted and shadowed by Japanese reconnaissance aircraft, and apparently he had no fighter aircraft at his disposal to deal with that situation. His force comprised no aircraft carrier, and he was therefore

dependent for air support upon the R.A.F. based on Malayan airfields, which was not under his own command. Whether he had not requested this support, or whether he had requested it and had been refused, is not known to the public ; but the fact remains that no such air support was available.

As soon as his movements had been observed and would, therefore, be known to the enemy, there would be no chance of his catching the Japanese transports unawares ; they would undoubtedly have been withdrawn out of his reach before he could get at them. Moreover, his force would probably become the target for attack by submarines, of which the Japanese undoubtedly had at their disposal a very large force. It would also be the target for heavy air attack as soon as it came within reach of airfields at Japan's disposal, which by now included not only those of Indo-China but those of Siam as well. There was therefore no object in his pursuing his original object, and Sir Tom Phillips therefore turned his force back after dark in order to return to Singapore. The next day, however, his ships were once more located by enemy reconnaissance aircraft—later a Japanese report stated that they had also been reported by Japanese submarines.

Towards noon he was attacked from the air, the attacks being concentrated on his two heavy ships. The first attack was by high bombing from about 15,000 feet in which hits were made both on the Prince of Wales and Repulse. The damage done to the Prince of Wales in this attack appears to have been trivial, and though the Repulse's fighting efficiency was not affected, one bomb penetrated to the engine-room, did a certain amount of damage there and started a fire ; but the ship was not at any time out of control. The bomb attack was immediately succeeded by a very heavy and skilfully conducted attack by torpedo aircraft, made in three waves of nine aircraft in each wave, 27 in all. The aircraft used were two-engined planes carrying a large torpedo : they must, therefore, have been operating from airfields on shore, since they were too large to have been operated from a carrier. Seven of them were reported to have been shot down by A.A. fire from the ships ; but enough were left to inflict fatal damage. The Repulse was hit by several torpedoes and sank. The Prince of Wales was hit aft by one of the first attacks and her rudder and propellers put out of action—in very much the same way that the Bismarck had been disabled by the torpedo from the Ark Royal's aircraft. The Prince of Wales thus became an easy target for subsequent waves of attack. She was hit by a large number of torpedoes and sank half an hour later ; some 2,300 officers and men out of the nearly 3,000 in the two ships were picked up by the attendant destroyers. With the work of rescue the enemy air forces did not attempt to interfere, but neither Admiral Tom Phillips nor Captain Leach, who commanded the Prince of Wales, were amongst those who were saved. When news of the attack reached Air Headquarters, fighter aircraft were at once despatched and reached the scene within the hour. This, of course, was not soon enough to have any effect on the main attack, for the enemy air forces by then had departed ; but it may well have been responsible for the success in rescuing so large a number of the ships' companies.

At the time of writing it is not known where the responsibility lies for the omission to provide the Repulse and Prince of Wales with the air support which the experience in the Mediterranean—in Crete in particular—had shown to be essential in such circumstances. Without that knowledge it is not justifiable to attribute blame to any person or authority

for a disaster which had such far-reaching effects. That has not prevented many self-appointed judges, in Parliament and outside it, from pronouncing condemnation on this authority or that ; but it has undoubtedly been at the bottom of the demands made frequently in Parliament, that an enquiry into the whole circumstances of the campaign in Malaya should be held.

The effect of the loss of the Prince of Wales and Repulse, taken together with the practical immobilisation of the American Main Fleet at Pearl Harbour, was that it became unnecessary for the Japanese to provide anything stronger than cruisers for the numerous invasions and combined operations which they had in contemplation in the East Indies. They possessed a large preponderance of cruisers, heavy and light, destroyers and submarines ; and they were able with these forces alone to exercise almost complete command of East Indian waters so far as the operations of surface ships were involved. They also possessed a large and very efficient naval air service which needed only the use of many airfields—for which the East Indian Archipelago provided the location—to dominate the air above the sea areas of that region. Their plan of campaign therefore was to move from island to island, occupying each in turn with military forces, and so from airfield to airfield, thereby providing the air superiority which made their successive invasions possible.

The Netherlands Government did not hesitate to range itself with the other Allied nations against the Japanese aggressor, realising that one of his chief objectives were the riches and resources of the Netherlands East Indies. The Dutch fleet and naval air service were at once put at the disposal of the Allies and aided from the outbreak in their interests. The composition of the Dutch East Indian Fleet is not known with certainty. It certainly comprised the two cruisers De Ruyter and Java, and the third cruiser Sumatra may have been there too. It comprised six destroyers and a dozen or more submarines, all of which were exceedingly efficient, both in material and personnel. Indeed, the first Allied success in Malayan waters was the sinking of four Japanese transports in the Gulf of Siam on December 14 by a Dutch submarine. Dutch aircraft did good execution against Japanese cruisers and transports operating in East Indian waters. There was, however, no further naval action during the month in connection with the Malayan campaign which was taking the form of a gradual advance southwards through the Peninsula, overcoming resistance not only by superior forces constantly reinforced by new landings on the eastern coast, but also it would seem, by tactics more suited to the country than those of the British forces. Penang was evacuated in the face of this advance on December 18, and from that time onwards it appears that the Japanese, using local craft, were able to land small parties behind the British front on the west coast also. Absence of counter action afloat in the Straits of Malacca has not been fully explained.

The Japanese advance on Hong Kong from the mainland started on December 9. On the night of December 11 the garrison withdrew from Kowloon into the island of Hong Kong itself, and it had been hoped it would be able to hold out there for some considerable time. There was, however, no useful part which the local naval force could take in the defence since the evacuation of Kowloon deprived them of the use of Hong Kong harbour. Two destroyers of the local defence force were therefore sent away before the Japanese investment was complete, and a press correspondent who took a passage in one of them described the voyage in which

they eluded the much more numerous Japanese patrols, called at a Dutch naval port, and finally reached an Allied port—presumably Singapore—safely. The only naval craft which fell into Japanese hands at Hong Kong were a few small vessels, harbour craft, and auxiliaries.

The hope that the island would be able to hold out proved vain, for the Japanese were able to cross and land on the island on December 18. By Christmas Day they had occupied more than half of it, including the water supply, and it became impossible for the garrison to hold out any longer. Before the actual surrender, five motor torpedo boats, one of which was sunk with the 16 people in her, left Hong Kong and succeeded in reaching a Chinese port, from which they eventually arrived at Chungking. The original party comprised 26 British officers, 35 other ranks, one civilian, and 21 Chinese, the latter including the famous one-legged Chinese Vice-Admiral Chan Chak.

On December 16 the Japanese troops landed in North Borneo. On December 17 Dutch naval aircraft reported having hit a Japanese cruiser off Sarawak with a bomb, an exploit which was repeated on Sunday, December 21, when two cruisers were hit by Dutch bombs off Sarawak. All these cruisers were reported to have been set on fire by these attacks, as was a Japanese cruiser north of Celebes on December 28, when it was attacked by bombers of the Royal Australian Air Force. The position at the close of the year was that the Japanese had succeeded in landing in the Philippines, in North Borneo, and northern Malaya. Although they were being fiercely resisted by the garrisons of all those territories they were yet able to bring such superiority of force to bear that they were making steady progress in all. At sea they were in greatly superior forces and able to conduct combined operations where they would.

Besides those already recorded above, the following losses of ships of war were announced in the course of December ; the sloop *Parramatta* of the Royal Australian Navy ; the corvette *Windflower* of the Royal Canadian Navy ; the submarines *Tetrarch* and *Perseus* ; the auxiliaries *Banka* and *Chakdina* ; two trawlers, and one armed yacht.

H. G. T.

CHAPTER II.

FOREIGN NAVIES.

DURING the past year there is no doubt that the volume of naval tonnage laid down, launched and delivered for Britain and the United States has greatly exceeded that produced by the Axis Powers. This statement probably applies also to every category with the exception of submarines. All the evidence points to the fact that most of Germany's shipbuilding resources are still being concentrated on U-boat construction, though fortunately it is not possible to turn out trained crews at a corresponding rate.

With Japan's entry into the war the enemy campaign against shipping has extended over the Pacific and Indian Oceans as well as the Atlantic. In the spring and early summer of 1941 the tale of mercantile sinkings ascended to a peak, after which there was a marked improvement, maintained almost to the end of the year. This may be ascribed to the fact, now generally known, that the escorts provided for Atlantic convoys are much stronger than it was possible to afford a year ago. Moreover, the number of U-boat captains with marked talent for their detestable job has been sensibly reduced by the elimination of a number of "aces."

Surface raiders have been a less troublesome factor since the battleships *Scharnhorst* and *Gneisenau* were driven into Brest towards the end of March, 1941. A fresh sortie by an even more formidable combination—the battleship *Bismarck* and the heavy cruiser *Prinz Eugen*—was effectually quenched in the following May, the former ship being sunk and the latter driven into port to join the two first-mentioned raiders. Subsequently all three were heavily attacked by the Royal Air Force, a total of 4,000 tons of bombs being dropped on the dockyard area at Brest. In the course of these attacks the R.A.F. lost 43 aircraft and 247 lives. Apart from one excursion by the *Scharnhorst* as far as La Pallice, the three ships remained inactive.

Sundry raiders of the armed mercantile type have been satisfactorily accounted for during the past year. In March the Italian *Ramb I*, a former fruit carrier, was sunk by the gunfire of H.M.S. *Leander*. In May the *Penguin*, a German vessel, met with a similar fate from the guns of H.M.S. *Cornwall*, while her supply ship, the *Coburg*, was disposed of by H.M.A.S. *Canberra* and H.M.S. *Leander* in the same month. All these operations occurred in the Indian Ocean.

On November 19 a fierce action was fought in the Indian Ocean, about 300 miles to the westward of Carnarvon, Western Australia, between H.M.A.S. *Sydney* and a heavily armed raider, the *Kormoran* (ex-Steiermark). Exactly what happened is not clear, for though the raider was sunk, the *Sydney* blew up with all hands. According to statements made by prisoners, the Australian cruiser, which was doubtless anxious to dispose of the raider before darkness fell, closed the range and was heavily hit. Her fire control arrangements were destroyed, she caught fire, and was last seen blazing from stem to stern. It is, however, possible that she may have been torpedoed, as the *Kormoran's* equipment included torpedo tubes.

On November 22, in the South Atlantic, H.M.S. *Devonshire* surprised

a German raider with a number of boats containing oil drums and stores alongside her. Fire was opened on her and she was speedily sunk. In view of the presence of a submarine in the vicinity, no attempt was made to pick up survivors. This course was also followed by H.M.S. Dorsetshire when that cruiser encountered and destroyed another enemy raider, similarly occupied, in the same region shortly afterwards.

Air attacks on shipping continue, but are decidedly less formidable than they were. To some extent this is due to the stronger air patrols supplied by the Coastal Command, but another factor of importance is the equipment of fighter aircraft carried by certain ships in each convoy. Credit has also to be accorded to the stronger escorts which it is now possible to supply.

The First Lord of the Admiralty recently supplied some interesting figures concerning the defence of shipping against aircraft attack. During 1941 there were fitted in merchant ships no fewer than 12,988 anti-aircraft guns, and 4,849 ships were fitted with anti-aircraft devices other than guns. So greatly had the anti-aircraft gunnery efficiency of the Merchant Navy and its crews been improved through the exertions of Admiral Sir Frederic Dreyer, Inspector of Merchant Navy Gunnery, that merchant vessels and fighting ships between them had shot down 76 enemy planes, probably destroyed another 40, and damaged 89.

In last year's chapter on foreign navies, it was observed that the most notable lesson taught by the events of 1940 was that, though they could not be injured seriously by bombing, battleships were much more susceptible to torpedo attack from the air. This lesson has been driven home during 1941 by the torpedoing of H.M.S. Prince of Wales and Repulse, and of the German battleship Bismarck; and in regard to the limited effect of bombing, by the return to Germany in February, 1942, of the Scharnhorst and Gneisenau, notwithstanding the frequent attacks made upon them by the Royal Air Force during the preceding ten months.

UNITED STATES.

In another chapter a summary is given of the progress made by the United States Navy during the past twelve months. This does not by any means cover all the facts that have been published, nor does it go into details of new construction.

Appropriations for 1940-41 amounted ultimately, with supplementary votes, to \$3,626,094,838, and for the last financial year to a total of \$5,852,397,595; but on the outbreak of war with Japan these figures were completely overshadowed by the emergency vote of \$10,000,000,000 for defence purposes which was approved by Congress in December 1941. Of this total, \$845,000,000 was for naval construction. Provision was also made for the increase of the "emergency strength" of naval personnel from 200,000 to 500,000, and of the Marine Corps from 60,000 to 104,000 men. These figures, it should be noted, are additional to the peacetime totals of 232,000 for the Navy and 46,400 for the Marine Corps. Ultimately it is estimated that a total strength of about 1,000,000 men on naval service will be reached. Actual numbers on duty in November, 1941, were 311,861 U.S. Navy and 64,000 U.S. Marine Corps.

In his address to Congress on January 7, 1942, President Roosevelt stated that the nation would be spending a total of approximately \$56,000,000,000 on its war machine during the present year.

DEFENCE OF NAVAL BASES.

When Guam fell after a gallant but ineffective resistance, there must have been many Americans who recalled the fact that in February, 1941, votes were passed for expending considerable sums on the fortification of that island and Tutuila, Samoa. As approved, the bill authorised the outlay of \$4,700,000 on "the provision of bomb-proof shelters for personnel and for communication centres, and to make the harbour usable by both large and small surface vessels and by submarines." This project was virtually the same as that twice rejected by Congress since 1938. When at last money was provided, it was unhappily too late.

Practically all the new naval bases in the Western hemisphere were expected to be in operation early in 1942. Since 1939 there has been a great expansion in American naval bases, from seven shore establishments to nearly 30 major bases, supplemented by many additional auxiliary bases and training stations. An official summary of the work involved in this huge programme of development states :

"Indicative of the magnitude of shore developments, including those for aviation bases and facilities, are the figures covering contracts entered into by the Navy for the fiscal years 1940 and 1941—\$185,354,217 and \$603,199,632, respectively. For the fiscal year 1942, which started July 1, 1941, approximately \$394,500,000 had been contracted up to October 1.

"The Naval Air Stations at Quonset Point, R.I., and Corpus Christi, Texas, are examples of the rapidity with which some of the major shore facilities for the Navy's flying arm have been made available. The contract for the Quonset Point undertaking was signed in July, 1940. It involved an estimated construction cost of \$24,000,000. The station was commissioned on July 12, 1941.

"Here was an undertaking that normally would require two or three years, and actually was carried out in a year.

"The Corpus Christi Naval Air Station, estimated to cost about the same as the Quonset Point job, was contracted for in June, 1940. It was commissioned in March, 1941, and recently the first class of fliers graduated from it. This plant trains pilots after they have had their preliminary instruction at auxiliary naval reserve air bases.

"Some of the Western Hemisphere bases on the Atlantic are now serving the Navy's air arm, and all will be in use in the early months of 1942.

"Many knotty problems have been faced in this outlying base programme, whose geographic range included sub-Arctic regions where many feet of frozen peat had to be removed before even temporary structures might be built, and the tropics, where dense jungles had to be cleared before initial work could be undertaken. The remoteness of many of these locations obviously presented a problem in their construction.

"A few years ago the shores of the United States were not far distant for potential enemy aircraft nor difficult to approach. The programme of the last eighteen months has changed this picture, and shortly this ring of protection will be welded solid.

"The speed with which the Navy is constructing its outlying and lease-lend bases is important in the scheme of defence of not only the main coastline of the United States, but also of the vital Panama Canal area. The most northern of these defences is located in Newfoundland, with the line extending south with the establishment of bases in the Bahama Islands, at Bermuda, Antigua, St. Lucia, Trinidad and Georgetown, British Guiana, supplemented by additional stations located at San Juan, P.R.; St. Thomas, V.I.; Kingston, Jamaica; and extension of the established base at Guantanamo, Cuba."

A notice issued by the Department of State in January, 1941, gave the following particulars of the sites selected for the bases leased to the U.S. Government in the British West Indian island of St. Lucia :

"A final agreement has been reached between the Governments of the United States and the United Kingdom on the sites for the United States air bases in the island of St. Lucia. The sites are those recommended by United States experts.

"In addition to the site at Gros Islet Bay which, as has already been announced, is to be leased for the establishment of a seaplane base, it has now been agreed at the request of the United States Government to lease to them a site for a land plane base at Vieuxfort."

A few days earlier President Roosevelt had remarked that the harbour

at Gros Islet Bay was far superior to that in the adjacent French island of Martinique, and virtually dominated the latter.

In March, 1941, Rear-Admiral Ben Moreell, Chief of the Bureau of Yards and Docks, told the House Appropriations Committee that work would begin as soon as funds were made available on a \$100,000,000 fleet operating base at Vieques Island, off the eastern end of Puerto Rico.

Admiral Moreell said the Navy would have to build a harbour and breakwaters to protect the anchorage that existed in the lee of Culebra Island. With the coming of the projected two-ocean Navy, Guantanamo Bay (Cuba) would not be large enough to accommodate the fleet, and the Puerto Rico site, in the centre of the whole Caribbean group, constituted an ideal strategic location.

President Arias of Panama announced in March, 1941, that an agreement had been reached for the United States to build air bases and air defence stations on Panama territory to strengthen its Panama Canal defences. These bases would be occupied only for the duration of the European War, and Panama would be compensated.

To keep the Danish colony of Greenland from falling under Nazi domination, President Roosevelt placed the island under the protection of the United States Government. Arrangements were at the same time made for air and naval bases to be established there as a part of the system to protect the Western Hemisphere from invasion. This action was taken after it was learned that German reconnaissance planes had been flying over Greenland, presumably to determine the suitability of the terrain for air bases.

The arrangements for Greenland thus to enter the system of hemispheric defence was made with Henrik de Kauffman, the Danish Minister in Washington, in the name of the King of Denmark. The agreement was repudiated by the Nazi-dominated Danish Government, by whom Mr. de Kauffman was recalled. Mr. de Kauffman refused to recognise the recall order on the grounds that the Danish Government had acted "under duress" in consequence of the Nazi occupation of Denmark. The Secretary of State, Mr. Cordell Hull, thereupon announced that Mr. de Kauffman would continue to be recognised as the accredited envoy of Denmark in the United States.

In July, 1941, the U.S. Naval air station in Bermuda, the first of the new Atlantic defence bases to be formally established, was commissioned with brief ceremonies on Tucker's Island, one of the two islets which will ultimately form the site of the base. Captain Jules James, U.S.N., Commandant of the naval base, read the commissioning order issued by the Secretary of the Navy, and Lieut.-Commander Robert F. Hickey, U.S.N., who assumed command of the air base, read an order from Rear-Admiral Chester W. Nimitz, Chief of the Bureau of Navigation, assigning him to that duty.

The Secretary of the Navy also announced the establishment of the U.S. Naval base at Argentia, Newfoundland, as from July 15, 1941, the date on which the station was commissioned. During the same month the Secretary reported the establishment of three "off-shore" Naval air stations, one in the Caribbean Sea, one in mid-Pacific and one in the Aleutian Islands area, as detailed below.

The U.S. Naval air station in Trinidad was established as from August 1, 1941, the date of commissioning. This station is located in Carenage Bay, five miles distant from Port Of Spain, Trinidad. Commander Arthur W.

Radford, U.S.N., is the commanding officer. The station at Midway Island was also established as from August 1, 1941, the date of commissioning. The commanding officer appointed was Commander Cyril T. Simard, U.S.N. The station at Dutch Harbour, Alaska, was established as from September 1, 1941, the date of commissioning. This station is located on Amaknak Island, the commanding officer being Commander William N. Updegraff, U.S.N.

In August, 1941, two new Pacific bases, the Johnston Island and Palmyra Island Naval air stations, were commissioned, Lieut. Roland H. Dale being appointed to command the former and Lieut. David J. Welsh the latter. Both these officers are naval aviators. Johnston Island is 717 miles from Honolulu, and Palmyra Island is 975 miles south of Honolulu.

The Naval air station at Cavite, Philippine Islands (since occupied by the Japanese) was commissioned on September 1, 1941.

An additional base was made available in July, 1941, when Iceland was occupied by American naval forces. This operation was undertaken with the object of forestalling possible moves by Germany in the direction of Greenland and North America generally, as well as to guard against enemy attacks on North Atlantic shipping and particularly on supplies and munitions being transported to Britain.

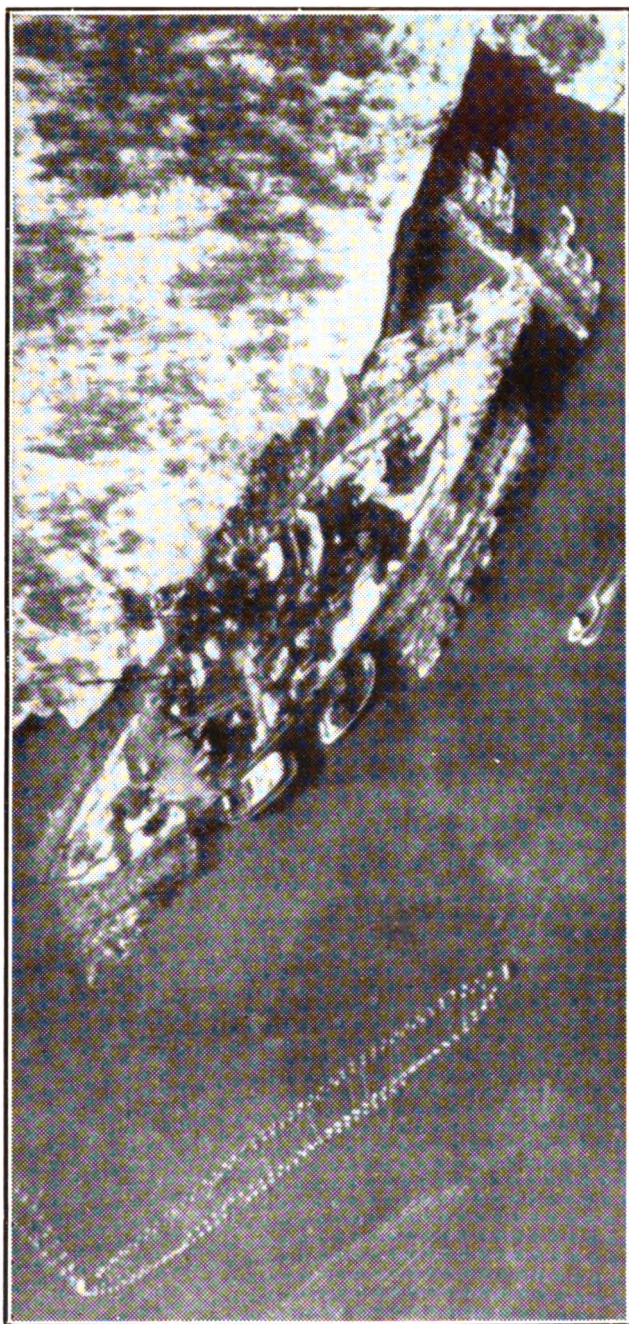
EXTENSION OF SHIPBUILDING AND MUNITION MAKING FACILITIES.

In January, 1941, expenditure voted by the House of Representatives included a sum of \$315,000,000 for the expansion of private shipyards to undertake the construction of new warships, and \$194,000,000 for doubling the Navy's ordnance manufacturing facilities. Contracts under which this money was to be spent were of three types. Under the first, the Navy would simply expand its existing facilities. Under the second, the private contractor would amortise his costs, through Navy payments, over a five-year period, at the end of which the Navy would obtain title. The third type provided that the Navy should advance the contractor 60 per cent. of the cost, the question of title or priorated ownership to be determined by agreement after five years.

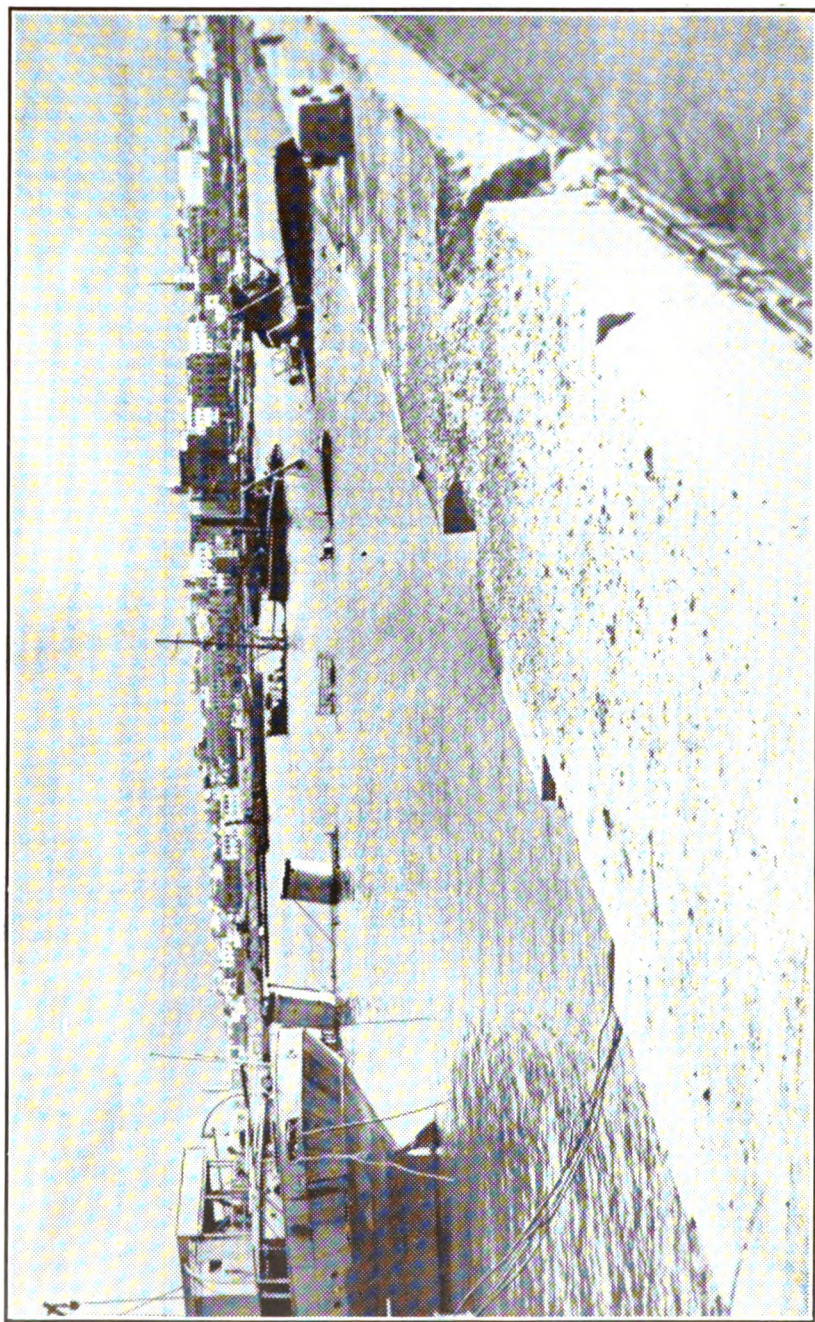
A month later it became known that a new dockyard, to include the largest graving dock ever constructed in the United States, was to be established at Bayonne, New Jersey. This yard will be under the Commandant of the Third Naval District, and its activities will be co-ordinated closely with those of the New York Navy Yard at Brooklyn. Thus it should lessen substantially the burden hitherto borne by that yard, though it will not affect proposed additions to the shipbuilding facilities at Brooklyn.

Exact dimensions of the new dry dock have not been disclosed, but it is known that it will be able to accommodate the largest battleships building or projected for the U.S. Navy. Its construction calls for an estimated expenditure of \$8,600,000 on a cost-plus-fixed-fee basis. In addition to docking facilities, there will be a naval supply terminal to cost about \$5,000,000, which when added to the purchase price of the 163-acre site, \$2,837,000, brings the total estimated cost of the new base to \$16,437,000.

With a view to improving dock accommodation on the Gulf of Mexico, a contract was awarded about the same time for the provision of a floating



A German battleship at an advanced base. The Tirpitz, sister ship of the Bismarck, in a Norwegian fjord.
(*British Official photograph.*)



The harbour of Benghazi after British air attacks. Sunken Italian destroyer and merchant ships.
(British Official photograph.)

dry dock at Galveston, Texas. This is to cost \$2,254,842, for which it is planned to get "the most modern floating dry dock in the world." It is to be of the sectional self-docking type, of all-welded construction. Novel features include a buoyancy chamber and a bottom of circular form, features which it is considered will combine economy with strength. Weight of this dock will be 4,800 tons, or about 25 per cent. of its lifting capacity of 18,000 tons. Dimensions over all are 614 ft. by 116 ft. It should therefore be able to take any existing United States cruiser.

In August last serious delay to the completion of contracts for the construction of naval and mercantile vessels, of a total value of \$498,000,000, was threatened by a strike of shipyard workers employed by the Federal Shipbuilding & Dry Dock Co., Kearny, N.J. Ships affected included a cruiser, six destroyers, two cargo vessels and three oil tankers. After 18 days spent in fruitless negotiations, the Navy took over the whole plant on August 25 under orders from President Roosevelt. After some months of naval control, the yard was returned to the management of its owners early in the present year.

Shortly afterwards it was announced that the Navy had purchased the old shipyard of the Submarine Boat Corporation at Port Newark, N.J., which had been standing idle since the last war. This yard, which covers an area of 112 acres in Newark Bay, turned out 150 merchant ships of standard type from 28 slipways in 1917-19. At the peak of its activity 13,000 men were employed in the yard, and it is hoped within a remarkably short time to have as many as 10,000 again working there.

Work was begun without delay with a view to laying down ships this summer, and it is hoped by November, 1942, to have the yard in full operation. Its management has been entrusted to the Federal Shipbuilding & Dry Dock Co., which is a subsidiary of the United States Steel Corporation.

In February, 1941, a contract was signed by the Navy Department for the construction near Canton, Ohio, of an ordnance manufacturing and assembly plant, to cost approximately \$16,150,000. On October 28 following, the Secretary of the Navy was present at the formal opening of another big ordnance plant at Centerline, Michigan. This enterprise will have about 5,000 employees and about 600,000 square feet of shop space, the total cost being \$20,350,000. A third naval ordnance plant was officially opened at Macon, Georgia, on November 15 last.

Together with other plants at Louisville, Kentucky, opened about the same time, and at Indianapolis and South Charleston, these undertakings will augment and in many respects duplicate the facilities of the Naval Gun Factory at Washington.

From the foregoing it is clear that no efforts are being spared to hasten the construction and armament of the projected "Two Ocean" Navy of the United States. Some details of the progress made with ships of different categories have also been released.

BATTLESHIPS.

Both the North Carolina and the Washington, the first of the six 35,000-ton battleships under construction, were completed last autumn. All the remaining ships of the class have now been launched, and two of them, the South Dakota and Massachusetts, may be ready for sea this year.

In appearance the North Carolina and Washington are distinctive, their relatively slender funnels being an outstanding feature which renders them readily distinguishable.

Good progress is also being made with the first four ships of the 45,000-ton "Iowa" class, of which there are to be six in all; and one or two of the five huge battleships of the "Montana" class, which it is believed will displace as much as 58,000 tons, have been begun. It is reported that these remarkable vessels, by far the biggest warships ever designed, will be 908 feet long with a beam of 120 feet. To enable them to pass through the Panama Canal the width of the locks is being increased. It is conjectured that in their main features the "Montanas" will be enlarged "Iowas", with a main armament of 16-inch guns.

In view of the very rapid progress made with the ships of the "Washington" class, there seems every justification for the hope that has been semi-officially expressed, viz., that the average time taken to build a battleship in an American shipyard will be reduced by fully twelve months. It used to take quite four years, but this period will soon have been reduced to three years.

To attain this end, red tape has been eliminated wherever it seemed likely to prove an impediment, and the utmost co-operation has been exacted from all concerned with the construction and the delivery of the necessary materials. Elaborate planning has been needed to ensure that the materials should be at hand when needed, that shop work is undertaken and completed in time for erection, and that design work keeps pace with construction requirements.

Thanks to these efforts, the first two 45,000-ton ships, the Iowa and New Jersey, are expected to go into commission at least 18 months ahead of schedule on the basis of present progress. One if not both may have been launched before this chapter appears in print. Only two considerations are likely to interfere with this prospect: delay in delivery of materials, owing to the greatly increased demands for them from shipyards all over the country; and the possible decision to accord priority to other categories of warships than battleships, e.g., aircraft carriers or destroyers.

Apart from the probability of deliveries being advanced as mentioned above, the five gigantic ships of the 58,000-ton type are scheduled to be commissioned in 1945 (Montana, Ohio and Maine) and 1946 (New Hampshire and Louisiana). They will all be built in huge graving docks and floated out when almost complete. It is intended that they should join the fleet about the same time that the new locks are opened on the Panama Canal.

Thus it is hoped to have a fleet of the projected "two-ocean" strength ready for action some time in 1944 instead of in 1946-47 as originally contemplated. This acceleration has been effected partly by working double and sometimes triple shifts in Navy yards and private shipbuilding establishments, authorisation of generous overtime pay, and extensive schemes for the training of new workers. In the private yards the Government had paid the overtime, as contracts were signed on the basis of a 40-hour week and an eight-hour day.

To what extent the outbreak of war has affected the rapid progress that was being made with capital ship construction is not known, but it should be borne in mind that last summer the Secretary of the Navy hinted that in the event of hostilities work might be suspended on heavy units in order to free skilled workers for the production of more destroyers,

submarines and aircraft. This intention may of course have been modified since the Pearl Harbour disaster. Still, it is improbable that additional capital ship tonnage authorised under the 1941 programme will be ordered at present.

BATTLE CRUISERS.

Although they are officially referred to as "large cruisers", there is every reason to believe that the six ships of the "Alaska" class (to be named Alaska, Guam, Hawaii, Philippines, Puerto Rico and Samoa) will be of a type better described as battle cruisers. Their displacement is understood to be over 20,000 tons and may be as much as 27,000 tons. Very high speed is said to be an outstanding feature of the design, a figure of 35 knots having been freely mentioned. Armament is expected to be six 14-inch guns. If any reliance is to be placed on these unofficial statements, it is clear that the ships are a species of battle cruiser, apparently intended as a reply to the Japanese armoured ships of the "Titibu" type.

All six ships were ordered in September, 1940, from the New York Shipbuilding Corporation of Camden, New Jersey. The Alaska was laid down last year, and others of the class have probably been begun since. Thus the United States Navy would appear to be the first to resume the construction of battle cruisers at a date when the type has almost become extinct—for H.M.S. Renown and the Turkish Yavuz are the only surviving ships officially rated as such.

AIRCRAFT CARRIERS.

The aircraft carrier Hornet was completed in October, 1941, considerably ahead of schedule. With a displacement of 20,000 tons, she is a replica in most respects of the Enterprise and Yorktown, though there is a trifling difference in appearance.

Of the eleven new aircraft carriers of the "Essex" class, the name ship was begun by the Newport News Shipbuilding Company on April 28 last, while the Cabot, first of the four to be built by the Bethlehem Steel Company at Quincy, Massachusetts, was laid down in the following August. Work has since started on others at both yards.

With a displacement of from 25,000 to 26,000 tons, these ships are expected to accommodate considerably more than the 80 odd aircraft which are carried by the Enterprise and her sisters. An armament of sixteen 5-inch, 38 calibre, dual purpose guns is foreshadowed, while the speed is expected to be in the region of 35 knots. They will thus, with the exception of the Lexington and Saratoga and the Japanese Akagi and Kaga, be the biggest aircraft carriers ever built.

Nothing more has been heard of the projected 30-knot liners to be capable of rapid transformation into aircraft carriers of 35,500 tons displacement, to which reference was made in last year's "Brassey". But another improvised type had made its appearance, described officially as an escort aircraft carrier. Half-a-dozen of these are said to be in hand, though only three are known definitely to have been altered from cargo vessels of standard type. These are the former Moore-McCormack motor-ships Mormacmail, Mormacland and Mormacfern, new vessels of nearly 8,000 tons gross, launched between July, 1939, and January, 1940. Only one has been photographed. This is the Long Island, ex-Mormacmail, the new names of the other two not having been published.

It is said that the conversion of these ships was effected in an average time of about 45 days. Work involved was principally the construction of a flight deck with a clearance of about 12 feet above the original upper deck, which has been transformed into a storage and service deck with connecting ramps. Removal of bridge and funnels and the provision of extra ballast to maintain stability had also to be undertaken.

It is understood that 30 fighter planes can be accommodated, the object of course being to employ each vessel as an escort to convoys in danger of attack by enemy bombers. The aircraft carried might also be employed in anti-submarine work, carrying depth charges for this purpose. Though the speed of these ships—16 knots—would be too low for operation with a fleet, it is sufficient for working with a convoy.

CRUISERS.

The first four cruisers of the 6,000-ton Atlanta class will all be in service by the time this chapter is published. Since they were not laid down until the spring of 1940, and were of an entirely new design, this is highly creditable to all concerned in their construction. Two (Atlanta and Juneau) were turned out by the Federal Shipbuilding & Dry Dock Company, of Kearny, New Jersey, and two (San Diego and San Juan) by the Bethlehem Steel Company, Quincy, Mass.

These cruisers carry the unusual armament of sixteen 5-inch dual purpose guns, mounted in somewhat similar fashion to the 5-25-inch guns of the British "Dido" class. Six torpedo tubes are also included in the equipment. Designed speed is exceptionally high, 38 knots being the figure reported.

Four more cruisers of this type, the Oakland, Tucson, Spokane and Reno, were laid down in the course of last year by the Bethlehem Steel Company at their Union Plant, San Francisco.

Good progress is being made with the 32 cruisers of the "Cleveland" class, of 10,000 tons, three, if not four, having been launched up to the time of writing. About half of the remainder had been laid down by the end of 1941. According to information from reliable sources, these ships will mount twelve 6-inch and twelve 5-inch guns, and will have a speed in excess of 33 knots.

Less is known about the eight cruisers of the "Baltimore" class, of 13,000 tons, which are all being built by the Bethlehem Steel Co. at Quincy. Nine 8-inch and eight 5-inch guns have been reported as their armament, but twelve of each calibre is a possibility, in view of the fact that the Wichita, of 9,324 tons, was able to carry the former combination. It is possible, of course, that the extra 3,700 tons will be absorbed by extra speed and protection.

Most of these cruisers are believed to have been begun, and in common with other new ships, progress is likely to be rapid. Twenty-six more cruisers are to be built under the 1941 Navy Appropriation.

DESTROYERS.

Very little more information is available than a year ago with regard to the 193 new destroyers then reported to be on order.

In this category of warship all records for rapidity of building are expected to be eclipsed. According to Rear-Admiral S. M. Robinson, Chief of the Bureau of Ships in the Navy Department, destroyers will

be turned out at the rate of 100 a year by the end of 1943. For example, the last of 43 ordered from the Federal Shipbuilding & Dry Dock Company is expected to be completed in October of that year. Already some of the 1,700-ton destroyers ordered under the 1940 programme have been completed within twelve months of the date of laying the keels, and it is hoped to reduce this time for the construction of later ships. A promising start has been made with the 2,100-ton type, the *Nicholas*, laid down in March, 1941, having been launched in a well-advanced state at the end of January, 1942, from the yard of the Bath Iron Works Corporation.

So far as can be ascertained, of the 193 destroyers in question, 78 will be of the 1,700-ton "Bristol" class, 111 of the 2,100-ton "Fletcher" class, and four others of a "special type", probably a modification of the 2,100-ton design.

Eighty more destroyers have been authorised under the 1941 programme and will doubtless be laid down as fast as slips are made available for their keels.

Of the three destroyers officially stated to have been lost at Pearl Harbour on December 7, 1941, one—the *Shaw*—has since been salvaged and sent to a Pacific coast yard for refit. Apparently her fore-castle was practically blown to pieces, but by shoring up bulkheads and building a false bow she was enabled to undertake the passage from Hawaii to the United States. Thus the net loss of destroyers by the Japanese attack has been reduced to two, the *Cassin* and *Downes*. On the other hand, three older destroyers, the *Truxton*, *Reuben James* and *Jacob Jones*, have been lost in the Atlantic.

SUBMARINES.

The last boats of the 1,475-ton "Tambor" class were completed in June, 1941. The *Mackerel* and *Marlin*, of 800 tons, were also delivered during the first half of last year.

About a dozen of the 78 boats of the "Gato" class, of 1,525 tons, had been launched by the end of February, 1942. Eight of this series are in hand at the Mare Island Navy Yard, two more having been ordered after the last issue of "Brassey" went to press.

There would have been a reduction in the number of submarines in service, but for the completion of these vessels, as *S 26* was lost by collision in January, 1942; *S 25* was transferred to the Polish Navy; and *R 8* is now H.M. submarine *P 511*.

OTHER SHIPS.

To enumerate in detail all the other new warships under construction for the United States Navy would occupy a great deal of space. The list includes over 100 motor torpedo boats and submarine chasers, though by now many of these must have been delivered; three 6,000-ton minelayers; about 300 minesweepers; six large and 16 small seaplane tenders; four large netlayers; four repair ships; three destroyer tenders; six submarine tenders; two transports; five petrol carriers; five submarine rescue vessels; ten fleet tugs; and between 20 and 30 coast guard cutters.

In addition, the number of merchant and fishing vessels and yachts that have been acquired by the U.S. Navy continues to increase, amounting so far as has been reported to two minelayers; four seaplane tenders; one destroyer tender; four submarine tenders; one hospital ship; 25 store and cargo ships; fourteen transports; ten oilers; one surveying

ship; 60 minesweepers; about 40 gunboats and patrol vessels; and a similar number so far unassigned to any category.

NAVAL AIR SERVICE.

In common with every other branch of the U.S. naval organisation, the aviation department is undergoing a high degree of expansion. During the fiscal year ended June 30, 1941, the authorised complement of aircraft was raised from 10,000 to 15,000 planes. It is claimed by the Secretary of the Navy that "in design of aeronautical equipment and training of personnel, the lessons of the European War were rapidly absorbed and applied."

The Navy's increase in aircraft strength added 82 per cent. to its forces, largely in the way of dive-bombers and fighters, but with considerable increase in patrol types. The number of air stations was raised to 13. Pilot personnel was increased by 48 per cent. and on June 30 there were 8,104 aviation students under training.

It is estimated that for the 15,000-plane programme, a total of 17,000 pilots will be needed. In order to furnish the additional personnel required, the naval reserves were drawn upon, thousands of new students being enrolled for aviation training. By the end of 1942 it was calculated that the three chief training centres—the Naval Air Stations at Pensacola, Jacksonville, and Corpus Christi—would be turning out approximately 500 fresh pilots a month. The Naval Air Station at Miami is functioning as an advanced flying school, and is engaged in training all advanced students specialising in carrier-borne aircraft, who have received their basic instruction at Pensacola.

With the commissioning of new bases at Atlanta, New Orleans and Dallas, the number of Naval Reserve aviation bases was brought up to 16. Having had assigned to them 100 additional training aircraft, these bases will be readily capable of training a quota of 1,200 students a month.

A total of 2,059 new aircraft were added to the Navy during the fiscal year 1941. Funds appropriated for naval aviation purposes during the same period amounted to \$982,320,000. For the following year the figure was estimated at \$945,411,100, but this will almost certainly be exceeded.

PERSONNEL.

In March, 1941, Mr. Ralph A. Bard, a director of the American Ship-building Company, was appointed Assistant Secretary of the Navy in succession to Mr. Lewis Compton, whose health had not proved equal to the strain of office.

At the end of August it was announced that Mr. Artemus L. Gates had been selected for the vacant post of Assistant Secretary for Aeronautics. This appointment was a revival of one last held by Mr. David S. Ingalls from 1929 to 1932.

It is interesting to note that Mr. Gates, who was President of the New York Trust Company, has had war experience. In 1917, at the age of 21, he volunteered for duty with the U.S. Naval Air Service, with which he served in European waters. While in charge of the Naval air base at Dunkirk in 1918 he was awarded the British D.F.C. and the French Croix de Guerre with palms, in addition to the American Distinguished Service Medal (Naval).

Ten days after the Pearl Harbour disaster a series of changes in naval

commands was announced. The Commander-in-Chief of the Pacific Fleet, Admiral Husband E. Kimmel, was relieved of his post, and Rear-Admiral Chester W. Nimitz, Chief of the Bureau of Navigation, appointed to succeed him with the rank of Admiral. The new Chief of the Navigation Bureau was Rear-Admiral Randall Jacobs.

Admiral Ernest J. King, hitherto Commander-in-Chief of the Atlantic Fleet, succeeded to the post of Commander-in-Chief, United States Fleet, also vacated by Admiral Kimmel. In March, 1942, Admiral King united with this appointment that of Chief of Naval Operations, the former holder of which, Admiral Harold R. Stark, had been selected for the command of U.S. Naval Forces in European Waters. In this post he was to include the duties previously discharged by Vice-Admiral Robert L. Ghormley as Naval Observer in London.

Admiral Royal E. Ingersoll, who had been Assistant Chief of Naval Operations, took over the command of the Atlantic Fleet from Admiral King.

Admiral Thomas C. Hart, Commander-in-Chief, Asiatic Fleet, asked to be relieved owing to ill health, and was replaced in February by Vice-Admiral William A. Glassford, Junior, who however was designated as Vice-Admiral Commanding U.S. Naval Forces in the South-West Pacific.

At the same time Vice-Admiral H. F. Leary was appointed to the command of U.S. Naval Forces in Australia and New Zealand waters.

Less has been heard lately of the shortage of officers which was causing concern a year ago. Energetic measures have been taken to remedy this by entering Naval Reserve officers in large numbers. Most of these correspond to British R.N.V.R. officers. During the fiscal year 1941 the total increase in number of officers was 15,259.

At June 30, 1941, U.S. combatant ships were mostly manned at 100 per cent. of their full complement, plus an additional contingent of newly commissioned Reserve officers and seamen under training. Thus the recommendation made by Admiral Nimitz in December, 1940, has been largely carried into effect. (vide "Brassey" 1941, page 71).

JAPAN.

Having taken the plunge into war on the side of the Axis, Japan has certainly wasted no time. By taking the United States Pacific Fleet by surprise at Pearl Harbour on December 7, 1941, time was gained in which further attacks on Singapore, the Philippines and the Dutch Indies were consummated. One of the enemy's principal objects in the last-mentioned area was to gain control of the extensive oil deposits in Borneo, Sumatra and Java, but it is believed that the thoroughness with which the Dutch authorities carried out their "scorched earth" policy must have largely disappointed Japanese hopes in this direction.

Though the ordinary naval budget for 1941-42 provided for a total expenditure of 1,241,000,000 yen, this was exclusive of supplementary credits and the China campaign fund.

BATTLESHIPS.

Little more information has come to hand concerning the new 45,000-ton battleships under construction, beyond the report that one of them may be named Tosa. It has also been suggested that the Nissin, launched at Kure on November 30, 1939, may prove to be a seaplane carrier of the

"Miduho" type. Another possibility is that the Takamatu, which was believed to be a new battleship, may in fact be an armoured ship of the "pocket battleship" type. A fresh name reported as belonging to a ship of the latter category is Titibu. Two other vessels previously supposed to be "pocket battleships", the Hachijo and Kasino, are now thought to belong to types of less importance.

One minor mystery seems to have been solved. The name Kazekuru, which a French source assigned to a "pocket battleship", is now believed to be a misreading of Kurukaze, the name of a destroyer launched in September 1939. This word is understood to mean "head wind".

AIRCRAFT CARRIERS.

There is no doubt that the Shokaku and Zuikaku were both completed by the end of last year, but there is considerable uncertainty about the third ship of the smaller "Soryu" class. Though she was reported to have been laid down at Kure under the name Koryu, doubt has been cast on the authenticity of this information, and pending further evidence her existence must be regarded as somewhat doubtful.

CRUISERS.

Nothing more has been heard of the five cruisers of about 8,000 to 9,000 tons so long supposed to have been under construction, and names that were tentatively attached to this type have since proved to belong to vessels in other categories. It now seems doubtful whether in fact these ships were ever begun, reports which were supposed to have related to them being in fact connected either with the "pocket battleship" group or with the three seagoing training ships mentioned in a later paragraph.

DESTROYERS.

A good many more 2,000-ton destroyers are believed to have been built, though few particulars have been received. There is reason to believe that a number of the older destroyers, removed from the effective list with a view to disposal, have been retained, and are being utilised in sundry subsidiary capacities.

SUBMARINES.

Though no more information has come to hand concerning submarine construction, this is suspected to have been proceeding busily, under German inspiration. It would not be surprising therefore if the total of Japanese underwater craft were to prove considerably greater than listed.

Reports that have been current for some years past of a tiny type of submarine have proved to be well founded, these midgets having made their debut at Pearl Harbour. There seems however no reason to depart from the view that this is an experimental type, of little practical value. According to American statements, the boats are 41 feet in length, are armed with two 18-inch torpedo tubes and are operated by a crew of two men. They appear to have been launched from a depot ship, much as H.M.S. Vulcan used to launch third class torpedo boats in the 'nineties of last century. In the attack on Pearl Harbour the loss of five of these little vessels was admitted by the enemy, and nothing was accomplished for this expenditure.

MISCELLANEOUS.

A third seagoing training ship of 5,800 tons, the *Kasii*, was launched on October 15, and has since passed into service. There can be little doubt that this type is intended for minelaying.

Names now believing to belong to minelayers of the 720-ton type include *Sokuten*, *Sirakami*, *Nariu*, *Sumisu*, *Kyosai*, *Kunaziri*, *Hasidate*, *Isagaki* and *Tanzuru*. Two other names which may possibly appertain to the same class, though described as resembling sloops in appearance, are *Hachijo* and *Hasitatu*. *Sumida* and *Uji* are probably names of river gunboats of the *Husimi* type.

American accounts agree that one or two 17,000-ton liners of the "Yawata Maru" type, built in 1940, have been completed as seaplane carriers. One of these auxiliaries was destroyed in the course of an attack by the United States Navy on a Japanese base in the Marshall Islands early in February of this year.

Otherwise it is extremely difficult to determine the extent of Japanese war losses, though a number of cruisers, destroyers and submarines are believed to have been sunk.

FRANCE.

Though occasional movements of cruisers and smaller craft are reported, that portion of the French Navy controlled by the Vichy Government has been comparatively inactive during the past year.

BATTLESHIPS.

Of the two 35,000-ton battleships, the *Richelieu* still lies at *Dakar*. There have been reports that the damage done to her by British depth charges and torpedoes on July 8, 1940, has been repaired; but in view of the fact that there is no dry dock at *Dakar* capable of accommodating so big a ship, it is hard to credit these stories. Nor is there believed to be any truth in the rumour that the *Jean Bart*, at *Casablanca*, has now received her full armament, since to transport from France and instal on the spot eight 15-inch guns, with their two huge turrets, would be anything but a simple matter.

Early in 1942 it became known that the 26,500-ton *Dunkerque* had been patched up sufficiently to make the passage from *Oran* to *Toulon*, which the obsolescent *Provence*, of 22,189 tons, had performed some months earlier. One if not both ships may be expected to undergo complete refit, so they are unlikely to be ready for active service for some time to come.

The *Bretagne*, sister ship of the *Provence*, capsized and foundered in the harbour of *Mers-el-Kebir*, *Oran*, as the result of the damage received on July 8, 1940.

AIRCRAFT CARRIERS.

There is no change in the position of the *Béarn*, laid up at *Fort de France*, *Martinique*, nor is it likely that any attempt will be made to remove her to another port without the concurrence of the United States Government.

CRUISERS.

There is considerable uncertainty about the fate of the *Lamotte-Picquet*, which was last reported at *Saigon*. Presumably, in common

with the other resources of Indo-China, she has been taken over by the Japanese ; but whether they will go so far as to employ her in operations against the Allies is questionable.

Three cruisers were reported to have been ordered to proceed from Dakar to Diego Suarez, the French naval base in Madagascar, about the end of February of the present year, but this has not been confirmed.

DESTROYERS AND TORPEDO BOATS.

On commissioning the new destroyers *Epée*, *Fleuret*, *Le Corsaire* and *Le Flibustier* were given the respective new names of *L'Adroit*, *Foudroyant*, *Siroco* and *Bison*, to commemorate the services of four ships of those names lost in action against the German Navy in May and June, 1940.

On June 15, 1941, the destroyer *Le Chevalier Paul* was torpedoed by British naval aircraft off Beirut while resisting the Allied advance along the Syrian coast. Three ships of similar type, the *Guèpard*, *Vauquelin* and *Valmy*, succeeded in making their escape from that port before the armistice was signed, and arrived at Toulon on July 22, 1941. It may be conjectured that the main object of the Vichy Government in dragging out the negotiations for a cessation of hostilities in Syria was to give time for these ships to escape, since one of the conditions under which the convention was signed was that all ships lying in Syrian ports should be surrendered.

Ships demilitarised and laid up at Alexandria include the *Basque*, *Forbin* and *Le Fortuné*. Nine others, *Le Triomphant*, *Léopard*, *Mistral* and *Ouragan*, rated as destroyers, and *La Cordelière*, *La Flore*, *L'Incomprise*, *La Melpomène* and *Bouclier*, classed as torpedo boats, are with the Free French Naval Forces. It will be recalled that the *Ouragan* was one of the ships officially stated to have been lost during the withdrawal from Dunkirk, but it is now known that this was a mistake for the *Orage*.

Another of this class, the *Cyclone*, was scuttled at Brest to avoid falling into enemy hands in June, 1940.

SUBMARINES.

The submarine *Morse* has been lost, having struck a mine off Sfax, in Tunisia, in 1940. The *Souffleur* was sunk in action with British light forces off the coast of Syria on June 25, 1941.

Submarines with the Free French Naval Forces are understood to be the *Rubis*, *Turquoise*, *Nautilus*, *Junon* and *Minerve*. The *Protée* is laid up at Alexandria.

MISCELLANEOUS.

Other vessels wearing the Free French ensign include the obsolete battleships *Courbet* and *Paris*, the sloop *Savorgnan de Brazza*, the mine-sweepers *Chevreuil*, *La Surprise*, *Moqueuse*, *Commandant Duboc* and *Commandant Dominé*, the patrol vessels *Amiens*, *Arras*, *Belfort*, *Épinal* and *Lassigny*, the target ship *Impassible*, the surveying vessel *Président Theodore Tissier*, the fleet tug *Actif* and the training schooners *L'Etoile* and *La Belle Poule*, besides some miscellaneous small craft. Recently a number of corvettes have been lent to the Free French from the British Navy. One of these, the *Alysse*, has been lost.

ITALY.

In the past twelve months further defeats have been inflicted on the Royal Italian Navy. So far as is known, no further scapegoats in high command have been dismissed or retired as a result ; but since the main guidance of Italy's sea operations appears now to be in German hands, that is not surprising.

BATTLESHIPS.

No more has been heard of the two 35,000-ton battleships that have been under construction since 1938, the *Impero* and *Roma*, and it is reported that shortage of materials has delayed their completion. As the wrecked *Conte di Cavour* is believed still to be under salvage or repair at *Taranto* (if indeed she is capable of again being made seaworthy), this leaves the Italian battle fleet at a maximum strength of five ships.

CRUISERS.

It is probable that fully 50 per cent. of Italian cruiser strength has been eliminated since June, 1940. Three 10,000-ton ships, the *Fiume*, *Pola* and *Zara*, were sunk at the Battle of Cape Matapan ; and their sister ship, the *Gorizia*, was torpedoed by a British submarine on June 29, 1941. A fifth 10,000-tonner is also suspected to have been lost.

Of the four cruisers of the " *Bande Nere* " class, only the name ship survives, as the *Bartolomeo Colleoni* was sunk by H.M.A.S. *Sydney* in July, 1940, and the *Alberico da Barbiano* and *Alberto di Giussano* were torpedoed by a division of Allied destroyers last December. British submarines have accounted for the *Armando Diaz* and at least three other cruisers.

There is still no news of any of the twelve 41-knot cruisers of the " *Regolo* " class having been seen at sea, nor has anything further transpired concerning the two 8,000-ton ships of the " *Ciano* " class or the two smaller ones under construction in Italy for the Siamese Navy. All this suggests that shipbuilding in Italian yards is greatly retarded.

DESTROYERS AND TORPEDO BOATS.

Losses in destroyers and seagoing torpedo boats have been heavy during the past year. Since the war began the total number of casualties cannot have been less than 40, and may well have been more. These can hardly have been replaced to any extent, as the new construction in hand comprised only a dozen craft. Two or three more may have been seized in Yugoslav harbours, but after allowing for all possible reinforcements, there is no doubt the Italian fleet must be getting short of destroyers.

Motor torpedo boats, or *motoscafi antisommergibili* as they are officially rated, have accomplished little or nothing, beyond suffering severe losses, notably in the attack on Valetta Harbour on July 26, 1941, when a dozen of them were destroyed. Five skiffs driven by outboard motors, with a torpedo attached, suffered a similar fate on this occasion, despite the deliberate sacrifice of the M.T.B.'s in an effort to cover their approach.

SUBMARINES.

From the frequency of announcements from Rome of the non-return from patrol of submarines, it is evident that the mortality in this category

is also considerable. It was disclosed by the Admiralty recently that on October 25, 1941, the *Galileo Ferraris*, of 880 tons, was sunk by the gunfire of H.M.S. *Lamerton* in the Atlantic. An interesting feature of this announcement is that the *G. Ferraris* is the last of a class of four, the other three having been disposed of during 1940. Support is thus given to the belief that the percentage of losses is a high one.

Another item released for publication by the Admiralty relates to the *Ammiraglio Caracciolo*, of 1,461 tons, one of the biggest submarines in the Italian Navy. She was sunk by H.M.S. *Farndale* in December last while on passage from Cyrenaica to Italy with a number of military staff officers on board. This submarine, it may be noted, was named after the Neapolitan "quisling" who was hanged as a traitor in 1799. Though some historians and biographers, adopting Italian views, have suggested that *Caracciolo* was hardly treated, it may be observed that Nelson, who was acquainted with all the circumstances of the case, fully concurred with the sentence of the court-martial that condemned him. A second submarine of this type, the *Ammiraglio Millo*, has since been sunk.

Yet another fact that suggests Italy is getting short of submarines may be found in the fact that late in 1941 a number of U-boats from Germany made their appearance in the Mediterranean.

AUXILIARIES.

Three naval oilers are known to have been lost to Italy. One, the *Brennero*, of 9,790 tons, was taken into protective custody by the United States Government in March, 1941, and is now presumably being used for Allied benefit. Another, the *Bronte*, 8,238 tons, was captured by British naval forces at Bandar Shahpur, Persia, in August, 1941; and a third, the *Giove*, 9,540 tons, fell into our hands at the surrender of Massawa in April, 1941.

GERMANY.

Apart from the submarine campaign, the principal German exploit at sea during 1941 was the abortive sortie into the Atlantic of the *Bismarck* and *Prinz Eugen* in May.

BATTLESHIPS.

With the elimination of the *Bismarck*, whose standard displacement may safely be reckoned at over 40,000 tons, Germany's only capital ships are the *Tirpitz* (sister ship of the *Bismarck*) and the 26,000-ton *Scharnhorst* and *Gneisenau*. The former was recently located at Trondheim, while the other two battleships were reported at Wilhelmshaven and Kiel, respectively, undergoing repairs needed as the result of their long stay at Brest and hazardous passage back to Germany.

There is no indication that any appreciable progress has been made with the construction of the third and fourth ships of the "*Bismarck*" class.

CRUISERS.

It is claimed by the Soviet authorities that the cruiser *Köln* was sunk in action with Russian warships and coastal batteries in the Gulf of Finland on September 28 last. Taking this into account, it would appear that Germany has no more than five cruisers left in service—the 10,000-

ton Admiral Hipper and Prinz Eugen and the smaller Nürnberg, Leipzig and Emden—unless the “pocket battleships” Admiral Scheer and Lutzow are counted as cruisers. There is nothing to suggest that the Seydlitz has passed into service, nor that any other new cruisers have been completed.

DESTROYERS AND TORPEDO BOATS.

Nearly 20 German destroyers or seagoing torpedo boats are claimed by the Russians to have been lost in operations in the Baltic or off the northern Soviet shores. Accepting this as approximately accurate, about 45 may still be in service.

Torpedo boats of the motor type, rated in the German Navy as *schnellboote*, have been unnecessarily wrapped in mystery, and so invested with undue importance, by the application of the meaningless title “E boat” to every boat mentioned in British Admiralty communiqués. Their principal employment has been to attack British convoys in the North Sea and Channel, but of late they have more than once been intercepted by our own light craft and have suffered several losses. Undoubtedly Germany possesses a large number of these troublesome little vessels. As they can be built rapidly in small shipyards, they are more likely to be risked freely than bigger ships.

SUBMARINES.

Up to the date of writing, the identities of 14 lost U-boats have been made known. These are U 13, U 26, U 73, U 95, U 99, U 100, U 111, U 131, U 433, U 434, U 501, U 556, U 570, and U 574. Three of these—U 131, U 434 and U 574—were destroyed in a single attack on an Atlantic convoy on December 17–19. It is beyond question that the total number of German submarines disposed of must be very large, but not until the war is over will it be possible to arrive at a definite figure. It is satisfactory to learn that in such cases as have recently been published, the quality of the personnel manning these vessels seems to have been by no means first class.

RUSSIA (SOVIET UNION).

Though the Union of Soviet Socialist Republics has become one of the Allied nations fighting against the Axis, little more is known about the Russian Navy than before.

BATTLESHIPS.

A new 35,000-ton battleship was demolished on the slip at Nikolaiev before the German Army entered that port. Nothing is known of the progress made with her sister ship at Leningrad.

The Germans claim to have reduced the obsolete battleship Marat to a wreck, as the result of persistent air attacks, at Kronstadt. This may be true, since her armoured deck is only three inches in thickness; but in view of the limited results obtained by bombing capital ships elsewhere, this enemy claim should be received with caution.

CRUISERS.

Another German assertion is that a cruiser fell into their hands at Nikolaiev. Though it has been suggested that this was the fourth ship of the “Kirov” class, the Orjonikidze, it seems more likely that this

cruiser had already been commissioned and is in service elsewhere. Possibly some ancient cruiser used as a hulk may have been found more or less intact by the enemy.

In a recent Soviet communiqué the cruiser *Krasni Kavkaz* was referred to as having taken part in operations against German forces in the Crimea ; but as a rule names of Soviet ships are not mentioned.

DESTROYERS AND TORPEDO BOATS.

Four destroyers under construction were destroyed to avoid their falling into enemy hands at Nikolaiev. German claims to have sunk Russian torpedo craft can seldom be substantiated, and need not be repeated here except where names have been given. This seems to have been done in only three instances : the *Strashni*, stated to have been mined off Oesel in August, 1941 ; the *Karl Marx*, said to have been found scuttled in the entrance to the harbour at Tallinn when the enemy entered that port in the same month ; and the *Moskva*, claimed to have been sunk off the Roumanian coast in June, 1941.

SUBMARINES.

Though Berlin communiqués have from time to time alleged that Soviet submarines have been sunk, the total number, quite apart from any question of its authenticity, has not been large enough to reduce appreciably the strength of the Russian under-water flotillas, believed to amount to about 200 vessels.

OTHER EUROPEAN COUNTRIES.

DENMARK.

News of the Royal Danish Navy is almost non-existent, though it is learned that the minelayer *Lindormen* has passed into service. She is a vessel of 614 tons, with triple expansion engines designed to give a speed of 14 knots. Her armament comprises two 3-inch and three 20-millimetre guns ; 150 mines can be carried.

FINLAND.

In the operations in the Gulf of Finland last year, the coast defence ironclad *Ilmarinen* was sunk through striking a mine. She was one of the two principal units of the Finnish Navy, so her loss is likely to be felt severely. Built over ten years ago, she was a ship of 3,900 tons, armed with four 10-inch and eight 4·1-inch guns.

GREECE.

As a result of the German occupation of Greece, that country has suffered the loss of four destroyers, the *Vasileus Georgios*, *Leon*, *Psara* and *Ydra*, 11 torpedo boats, nine small minelayers and sundry auxiliaries. In addition, the submarine *Proteus* was reported missing. With characteristic courage, the Greeks have continued the fight at sea in conjunction with their Allies, and have not failed to extract some comfort from the omen that one of the warships remaining in service is the *Nike* (Victory).

Recently the Greek Prime Minister announced that certain new

British men-of-war were to be transferred to the Royal Hellenic Navy, and manned by sailors from the mercantile marine.

Unfortunately the report that a damaged Italian destroyer had been acquired by Greece, alluded to in these pages last year, proves to be without foundation.

NETHERLANDS.

The Royal Netherland Navy has suffered heavily in the Far East, where it has borne the brunt of the Japanese onslaught. Though full particulars have still to be received, it appears that the ships lost include the cruisers *De Ruyter* and *Java*; the destroyers *Evertsen*, *Kortenaer* and *Witte de With*; the minesweeper *Jan van Amstel*; the minelayer *Prins van Oranje*; at least one auxiliary, the *Wega*, of the Indies Government Marine; several submarines; and a dozen motor torpedo boats. Other casualties suffered during the past year include two minelayers, the *Van Meerlant*, sunk by enemy action, and the *Nautilus*, by collision; an escort vessel; and a trawler. Such losses are to be regretted, but were almost inevitable in a conflict against such heavy odds.

Vice-Admiral J. Th. Furstner was promoted to the rank of Admiral early in 1942, having previously been appointed Minister of the Navy. His successor as Chief of the Naval Staff is Rear-Admiral J. W. Termytelen.

NORWAY.

H.M.S. *Bath*, an ex-American destroyer sunk in August last, was one of a number of British ships manned by the Royal Norwegian Navy.

Rear-Admiral E. Corneliussen has succeeded Rear-Admiral Diesen as Commander-in-Chief, with Rear-Admiral E. C. Danielsen as Chief of the Naval Staff. Rear-Admiral H. Riiser-Larsen is in command of the Naval Air Service.

POLAND.

A number of new ships have been taken over by the Polish Navy in the past year, including the destroyers *Piorun*, *Krakowiak* and *Kujawiak*, formerly British, and the submarine *Jastrzab*, previously belonging to the United States Navy.

These transfers are in addition to that of the destroyer *Garland*, which retained her original name when transferred from the White Ensign to the Polish flag in 1940, and is now officially known as O.R.P. *Garland*.

PORTUGAL.

War having held up the expansion programme, there is little fresh to record concerning the Portuguese Navy. The surveying vessel *Dom João de Castro* has been completed, and the oiler *São Braz*—the first to be built in a Portuguese yard—was launched on March 17, 1942.

ROUMANIA.

The submarines S 1 and S 2 were both launched at Galatz in May, 1941. It is understood that others were laid down in the vacant berths. Doubtless all will be manned by German crews when ready for sea.

Rear-Admiral G. S. Dumitrescu, C.V.O., formerly Roumanian Naval Attaché in London, is now one of the leaders of the Free Roumanian movement in this country.

SPAIN.

Owing to the shortage of steel, the Spanish National Metal Syndicate recently arranged to scrap two old warships, the *Uad Muluya* and *Maquinista Macias*. The former, originally a steam trawler of 425 tons, was built for the Admiralty in 1917 as the *James Conner*, and was later renamed *Waveney*. On passing into Spanish possession she was classed as a gunboat. The *Macias* was a fishery protection vessel of 150 tons, dating from 1910. Both were removed from the effective list after the close of the Civil War, presumably as the result of damage, though possibly because they were too worn out to be worth refitting.

SWEDEN.

Sweden is practically the only neutral nation with any appreciable number of warships under construction. Though the projected coast defence ships have been held up indefinitely, two cruisers of 7,000 tons, the *Göta Lejon* and *Tre Kronor*, were laid down last year. Other vessels begun in 1941 include the destroyers *Magne*, *Mjölner*, *Mode* and *Munin*; the submarines *Näcken*, *Najad* and *Neptun*; and half-a-dozen motor torpedo boats. Vessels completed recently include the destroyers *Norrköping* and *Gävle*, the submarines *Sjöborren*, *Sjöhästen* and *Sjöormen*, 38 minesweepers and a number of motor torpedo boats. A merchant vessel has been acquired for use as a hospital ship, and has been named *Prins Carl*.

In September an unexpected and most regrettable calamity befell the Royal Swedish Navy. A sudden explosion, followed by a fire, occurred in the destroyer *Göteborg* while lying at her moorings near Stockholm. No satisfactory explanation of this explosion has yet been furnished, though the detonation of a torpedo warhead has been mentioned.

Further explosions followed, involving the destroyers *Klas Horn* and *Klass Ugglå*. All three ships ultimately foundered. It is reported that the destroyers were moored close to a magazine, which also blew up and added to the extent of the disaster.

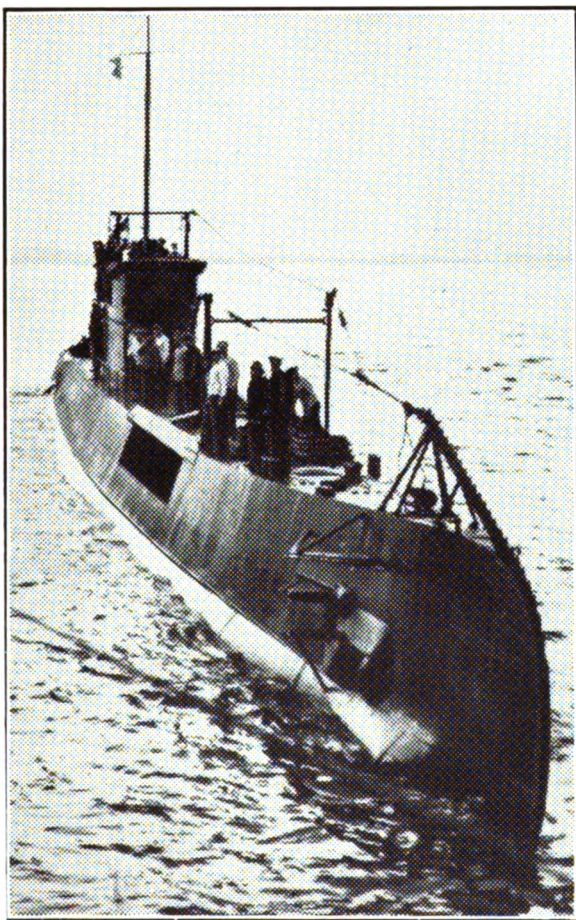
TURKEY.

One of the destroyers built in this country, the *Sultanhisar*, has been delivered at Alexandretta. To what extent other new construction has passed into service has not been reported, but it may be assumed that the small minelayers *Sivrihisar* and *Yüzbaşı Hakkı* were completed last year. Two motor minesweepers (ex-MMS 1 and MMS 2), acquired in 1939, have been renamed *Canak* and *Kavak*.

The new Turkish Ambassador to this country was well known to an earlier generation as Captain Raouf of the Turkish Navy. Practically the only bright spot for Turkey in the war with Greece in 1912-13 was supplied by the dashing exploits of the cruiser which he then commanded.

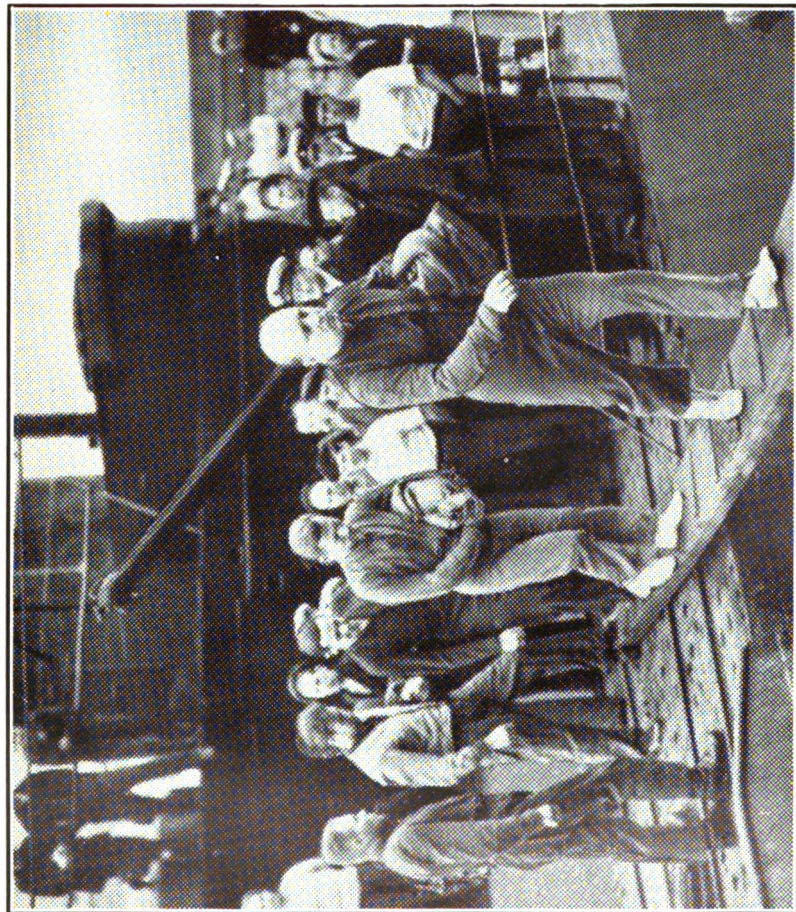
YUGOSLAVIA.

Overwhelmed by the Axis attack last year, the bulk of the Yugoslav Navy was unable to escape from the Adriatic. The destroyer *Zagreb* was blown up to avoid falling into enemy hands, and the submarine *Nebojsa* and one or two small craft succeeded in joining the Allied forces in the Mediterranean.



**A Netherlands submarine working with the Royal Navy
in the Mediterranean.**

(British Official photograph.)



German prisoners from U.95, sunk by a Dutch submarine, landing from their captor in a British port.
(*British Official photograph.*)

SOUTH AMERICAN REPUBLICS.

ARGENTINA.

On October 3 the destroyer *Corrientes*, a modern ship of 1,375 tons launched at Barrow in 1937, was lost in collision with the cruiser *Almirante Brown* during exercises. This destroyer was one of a group of seven built for the Argentine Navy in this country shortly before the war.

BRAZIL.

The destroyers *Greenhalgh*, *Marcilio Dias* and *Mariz e Barros* have all been launched, and are in process of completion at Rio.

CHILE.

Last year the Chilean Government accepted from Germany, as a gift, the steel four-masted barque *Priwall*, which had been lying in Chilean waters since the beginning of the war. She has been renamed *Lautaro*, and will serve as a seagoing training ship for naval ratings, in succession to the *General Baquedano*, now 44 years old, which has been relegated to harbour service.

A ship of 3,185 tons gross, the *Priwall* was built in the Blohm & Voss yard at Hamburg in 1920 for the Laeisz Company, who used her for some years in the nitrate trade. In recent years she has carried grain from South Australia to Europe.

Lautaro is one of the oldest names in the Chilean Navy. The first *Lautaro* was a 44-gun Spanish frigate, originally built as an East Indiaman, which was cut out from under the guns of the forts at Callao by Captain (afterwards Admiral) Guise in 1818, during Chile's second War of Independence. During the succeeding four years she took a prominent part under Lord Cochrane in the operations against the Spanish Navy. A later *Lautaro* was an iron gun vessel, launched at Valparaiso in 1881, and removed from the effective list some years ago.

CUBA.

Cuba is at war with the Axis powers, and has taken over for duty as naval transports the Italian merchant vessel *Recca*, of 5,441 tons gross, which has been renamed *Libertad*, and the Finnish *Koura*, of 3,835 tons gross, which has become the *Caribe*.

VENEZUELA.

The ancient gunboat *Mariscal Sucre* has been removed from the effective list. She was built for the Spanish Navy in 1886 as the *Isla de Cuba*, passed into the United States Navy as the outcome of the war of 1898, and was sold to Venezuela in 1912.

ASIA.

CHINA.

The Chinese Navy has received an accession of strength on the Yangtse. In February, 1942, the Admiralty announced that H.M. river gunboats *Falcon*, *Gannet* and *Sandpiper* had been presented to the Chinese Government. A month later the United States effected a similar transfer of the

gunboat Tutuila, which had been lying at Chungking since the outbreak of war with Japan. So far the new names of these four vessels have not been advised.

PERSIA.

Certain ships of the Persian Navy were rash enough to oppose the British landing at Bandar Shahpur in August last. In the issue, the sloops Babr and Palang were put completely out of action, one being set on fire and both having to be beached to save them from sinking. The Persian Admiral who had so unwisely led their resistance was killed. Four gunboats and a depot ship surrendered.

SIAM.

The Siamese Navy is now to all intents and purposes part of the Japanese fleet. Later advices from Bangkok state that only two Siamese vessels, the Cholburi and Songkla, became total losses in the action with the French cruiser Lamotte-Picquet and some smaller ships, referred to in last year's "Brassey". The coast defence ship Dhonburi was driven ashore, but has since been refloated.

FRANCIS MCMURTRIE.

CHAPTER III.

MERCHANT SHIPPING AND THE BATTLE OF THE SEAS.

WHAT would have been the probable course of events at sea if the German armies had invaded Russia in 1939-40 instead of overrunning the Low Countries and then defeating France, the military triumph being completed by the subjugation of Greece? When the enemy's confidence of winning the Battle of the Seas was highest, it was proclaimed from Berlin that that victory would be decisive in the war not only by sea, but on land and in the air; the German dream would be realised—*Deutschland über Alles!* And the enemy's conclusion was based on a correct appreciation of the situation. If, owing to a shortage of merchant tonnage,* the failure of the Royal Navy to maintain this country's life-lines, or the refusal of the merchant seamen to face the fearful odds, our communications had been cut, nothing could have saved the British people from complete defeat—however large and well-equipped their armies, however skilled the pilots of the R.A.F., however efficient the Home Guard, however active the A.R.P. services, however devoted the workers in mine, shipyard, or workshop. Ocean-borne supplies are essential to us.

Then why did not Germany win a quick victory at sea? The answer is—because her overwhelming military successes forced the shipping of the northern European seapowers to seek the hospitality of British ports, and, later, Greek shipping also sought welcome shelter with us. According to official figures, 1,952 ships of 8,750,000 tons gross were co-operating last year with British shipping in the fight for the freedom of the seas—Norway (3,800,000 tons); Holland (2,620,000 tons); Free France (570,000 tons); Poland (130,000 tons); Greece (1,280,000 tons); Belgium (370,000 tons); and other countries. That accession of strength, not only in ships but in trained seamen, keyed up to make, if necessary, the supreme sacrifice, was decisive. It became apparent that unless the Germans could speedily increase their rate of destruction of the much larger volume of tonnage at our disposal, the more efficient would become the offensive-defensive measures of the Admiralty and the greater the production of new tonnage in British, American, Canadian, and Australian shipyards.

Time was the important factor for the enemy. That is why a *blitzkrieg* was proclaimed by Hitler in February, 1941, when he pledged his word to the German people that the Battle of the Seas would be won by the end of April, about sixty days, by the forces on, over, and under the sea which were to be concentrated on a supreme effort. Every available submarine and aeroplane was pressed into the attack during this period, and then the battle cruisers *Scharnhorst* and *Gneisenau* and, later, the battleship *Bismarck*, reputed to be unsinkable, as well as the cruiser *Prinz Eugen*, were sent into the Atlantic to reinforce the onslaught which was being made on all shipping, irrespective of flag, going to or from ports in the British Isles.

What was the result of this *blitzkrieg*? In reviewing the course of the Battle of the Seas during 1941, the Minister of War Transport has stated: †

* There were 2,000,000 tons less seagoing shipping on the United Kingdom Register than in 1914.

† "The Shipping World," January 14, 1942.

"Looking back now I cannot doubt that we have come through a crisis which, though never so grave as that of 1917, might have left us in a position of great difficulty. In January the losses of British, Allied, and neutral shipping amounted to just over 300,000 tons. By April the monthly total had gone up to 600,000 tons. If sinkings had continued at this rate, before any substantial new tonnage was forthcoming, our powers of resistance would certainly have been impaired, aid to Russia would have been exceedingly problematic, and the effect might have been to add years to the war.

"As events showed, the enemy had under-estimated both the resourcefulness of the Royal Navy and the R.A.F., and also the fighting spirit of our merchant seamen. Our losses fell, and for every ship sunk our warships and aircraft exacted a heavy toll from the enemy. Our bridge of ships remained unbroken and our flow of imports satisfactory."

Lord Leathers also remarked that if the shipping position at the end of the year 1941 were contrasted with the situation at its opening, the country had "cause to be thankful." In the four months ended October, 1940, losses of merchant shipping were averaging over 400,000 tons a month; in the four months down to last October the average was 180,000 tons. During his visit to America at the turn of the year, the Prime Minister is reported to have recalled that in February he was very concerned at the high rate of losses in the Atlantic as a result of the combined operations of the enemy with Focke-Wulf Condors and U-boats. "However," he added, "we managed to drive the U-boats farther out and break the link between them and the aircraft. Many enemy aircraft have been shot down by the heavier armament of our merchant ships and by other methods which I cannot disclose"; and he added that British and Allied net shipping losses in the last five and a half months had been only one-fifth of those in the previous five months. "We are not suffering at the rate which can be said to be a decisive danger," he concluded.

The failure of the enemy to realise his ambition was due, in large degree, to the formation—in effect, the internationalisation, to use an ugly word—of the shipping of the freedom-loving nations of Europe and, later in the year, to the aid of the United States in guarding the route from the American Continent to Iceland. The consolidation of shipping under all the different flags extended the advantages of the British convoy system to *all* vessels, irrespective of their nationality. This course would have been regarded as politically inexpedient had the nations of the Low Countries, as well as France and Greece, been permitted by the enemy to remain neutral, at least for a time, and the enemy's attack had been restricted to such of their ships as, sailing independently, were proceeding to or from any port of the British Isles. In driving neutral tonnage to accept convoy, the enemy was hoist with his own petard.

NEW MACHINERY OF SHIPPING CONTROL.

Two outstanding events of the year 1941 were: first, the formation of the Ministry of War Transport under Lord Leathers, which absorbed the Ministry of Shipping and the Ministry of Transport, thus gaining unified control of shipping, railways, and road traffic; and, secondly, the creation of the General Council of British Shipping, representing the Chamber of Shipping of the United Kingdom and the Liverpool Steamship Owners' Association, with a view to facilitating the work of both bodies in relation to the war problems and post-war problems of the industry in so far as these affected *materiel*—rates of hire, insurance, replacement, etc. Thus the relations of the Government, in control of all ships, except a relatively small tonnage of coastal tramps, and the shipowners and their staffs, were co-ordinated in the hope of accelerating the progress of negotiations.

Matters concerning the welfare of the officers and men serving afloat

were left to the consideration of a department of the new Ministry and the National Maritime Board, the membership of which includes representatives of the owners, the officers and the men. The National Maritime Board was established, as a war measure, in 1917; it was designed to serve as a "clearing house" for ideas affecting the relations between owners and the officers and men serving afloat. Its success led to its being put on a permanent footing in 1919 as the governing body of the whole industry, thus promoting uniformity of conditions of service and wages in all ships on the United Kingdom Register, which had not hitherto existed. It has proved a bulwark against strikes which in the past threatened the country's sea communications, as, for instance, in 1911. Before the establishment of the National Maritime Board, a tug-of-war was usually in progress between the Shipping Federation and the organisations representing the officers and men. As a result of this tug-of-war between the years 1880 and 1914, A.B.'s wages in steamships were raised from 55s.-70s. a week to 100s.-110s., "all found". Then came the war of 1914-18.

Wages in shipping, as in other industries, soared during the war. They reached their peak in the autumn of 1918 when the A.B.'s wages stood at 290s., including war bonus, and they were maintained at this figure, as a consolidated wage, until the spring of 1921.

The "real wage", allowing for the change in the purchasing power of money, was at its highest in the spring of 1919, when 290s. represented a wage of about 141s. 6d. at the old values.

Unfortunately, the long slump has deprived the seaman in this respect of all that he gained, but it may be put to the credit of the National Maritime Board that the whole process of inflation and deflation has been accomplished without the disastrous conflicts and embittered sense of injustice which have proved so disastrous in other industries.

It must be added that wages were maintained at boom level long after the slump had set in, and that in 1924, when the outlook brightened for a moment, they were temporarily increased in anticipation of better times.

Improved working conditions, recognition of the Union (National Union of Seamen), the right to a national standard wage, and the establishment of permanent machinery of conciliation and consultation represent to the seaman the lasting gains of the war.

The officers have gained less in proportion, though the authorisation of a standard uniform and the appointment of H.R.H. the Prince of Wales as Master of the Merchant Navy imply a welcome advance in status.*

British shipping passed through the worst depression in its history in 1930-36, when almost all ships in all trades, ocean-going, short-sea, or coastal, were operated at a loss, with the result that the tonnage under the Red Ensign shrank, as owners had not the money with which to build new ships. The position became so serious that in July, 1939, the Government introduced into Parliament the British Shipping (Assistance) Bill, which was dropped when the war began.†

When the present struggle opened, the conditions of service on board ship, as well as wages, had been further improved as a result of the work of the National Maritime Board, and further progress has since been made. Continuity of service has been introduced in place of engagement only for a voyage, the pay of officers and the wages of seamen and others have been raised, and conditions of life at sea greatly ameliorated, though a seaman's life, like that of the miner, is necessarily a hard and hazardous one. In March, 1940, officers' pay was increased by £2 a month and the wages of seamen by £3, and an addition of £2 became effective on January 1, 1941, as "differential payment" in order to close the gap between British and Allied rates, the latter having been greatly increased under the peculiarly hard conditions in which the latter seamen were serving. The Chamber

* "A Short History of the World's Shipping Industry," by C. Ernest Fayle (George Allen and Unwin).

† *Vide* "Brassey," 1940, p. 87.

of Shipping in its report for 1940-41 estimated that, taking the rate for A.B.'s as a guiding rate, wage costs had increased over the pre-war wage of £9 12s. a month as follows :

10.4 per cent.—wages
20.8 per cent.—differential payment
52.0 per cent.—war risk money
<hr/>
83.0

Apart from wages, all the conditions of service of officers and men have been greatly improved as a result of negotiations through the National Maritime Board. It would take too much space to summarise all the ameliorations to the advantage of the *personnel*, but it has been conceded by the organisations of the officers and men that satisfactory progress has been made.

The King, in acknowledgment of the services which British seamen have rendered to the war effort, expressed in a Christmas message to the Minister of War Transport the feelings of gratitude of his subjects :

"After more than two and a quarter years of war the flag of the British Merchant Navy and Fishing Fleets still flies as proudly as ever, far and wide over the Seven Seas. Your fellow-countrymen know what all of you have endured to keep it so, and as the all-important cargoes arrive in an unending stream so do their gratitude and admiration grow.

"Many and great are the dangers that you are constantly facing with such courage and devotion ; but you have the satisfaction of knowing that our power to protect you, and to hit back at the enemy, becomes more formidable every day.

"I thank you, and I join with all your countrymen in sending you heartiest Christmas greetings and good wishes."

Owing to the shortage of newsprint and the consequent reduction in the size of *The Times*, the *Daily Telegraph*, and other national newspapers, the country has learnt little of the fortunes and misfortunes of officers and men of the many nationalities who have been fighting the Battle of the Seas. The silence has only infrequently been broken when information could be published without benefit to the enemy. But on January 1, 1942, *Lloyd's List*, besides publishing a long list of decorations conferred on scores of masters and men for conspicuous services, issued its fifty-fifth list of British casualties,* raising the total loss of life to upwards of 9,500—representing a much higher monthly rate than in the war of 1914-18.

A ROYAL COMMISSION PROPOSED.

But, though little has been revealed of the manner in which officers and men have met the hazards of the war, sufficient has become known to win the unbounded admiration of the nation. What can be done to mark the appreciation of their services ? That has been a natural question. Among the suggestions was a proposal sponsored by Lord Marchwood in the House of Lords on September 10, and supported by Admiral of the Fleet Lord Chatfield and other naval officers, that a Royal Commission should be appointed "to inquire into the conditions of service" with a view to raising the status of the *personnel*. The proposal was opposed by the Chamber of Shipping, in view of the concentration of owners and their staffs on the prosecution of the war, by the National Maritime Board, and by the organisations representing the officers and men, who claimed that such an inquiry would delay measures which were already being discussed by the National Maritime Board. Captain William H. Coombs, the

* No figures have been issued for Allied seamen.

Secretary of the Navigators and Engineer Officers Union, summed up the objections of his members to the setting up of a Royal Commission in the *Merchant Navy Journal* of September last :

"The majority of officers in the Merchant Navy to-day are not thinking in terms of uniform, decorations, or superficial status ; they are thinking as men who are serving and sacrificing in order that the world may become a decent place in which to live ; they are thinking particularly of their own 'yard arms', looking for a reasonable assurance that in their industry, as in all other industries, those employed shall live in greater economic security with a fairer share of leisure, material reward, and return for good services faithfully rendered."

Captain Coombs suggested that such matters as uniform, decorations, reception of seafarers landed from torpedoed ships, status, etc., could be dealt with under existing conditions.

"I would suggest that the first three topics are all capable of satisfactory adjustment through the existing machinery of contact between the seafarers' organisations, the Government Departments, and the shipowners' organisations. They are essentially war-time problems and merely touch upon the fringe of the essential problem. . . ."

"On the attractive, but really quite inconsequential subject of uniform, there is a Merchant Navy uniform—described with Royal approval in an existing Order in Council ; it has been suggested recently that the Merchant Navy should be granted the right to wear Naval uniform, but it was not indicated in what manner Naval rates of pay and Naval discipline could be divorced from this proposal. I am confident that the majority of Merchant Navy officers and seamen are not prepared to accept (certainly not without reference to them—which would be difficult in war-time) Naval rates of pay and subjection to Naval discipline."

What is the relationship of "The Merchant Navy" to the State ? British shipping is often referred to as the "Merchant Navy" ; but, in fact, British shipping is not a coherent disciplined force like the Royal Navy. It is an industry comparable to the coal mining, shipbuilding, iron and steel, wool and other industries, whose workers have made, at the peril of their lives, owing to enemy air raids, such magnificent contributions to the country's war effort. Shipping, like other industries, is provided by private investors, numbered by tens of thousands, and managed by keen business men. Its officers belong to protective associations, one of which is affiliated to the Trade Union Congress, while all the lower deck ratings belong to trade unions, foremost among them the National Union of Seamen. These bodies are also represented on the Trade Union Congress. The officers and men attach high value to the rights of combination which they possess in common with the staffs and workers in other industries. Moreover, the discipline on board merchant ships is not comparable in important respects to that enforced in men-of-war, and officers and seamen desire no changes.

PRIVATE ENTERPRISE OR STATE SERVICE.

On national grounds, too, there is reason to pause before adopting any measure which would bring the British shipping industry under closer control by any Government department. It has been urged, on the one hand, that British shipping should be nationalised. In the last war such a change was defeated by the combined efforts of the Minister of Shipping, Lord Maclay, the officers' associations, and the Seamen's Union under the leadership of the late Mr. Havelock Wilson, a poll revealing that the seamen themselves objected to the proposal.

As has been remarked, British shipping is not appropriately described as "the Merchant Navy", nor is it "a national service". The difference between the Royal Navy and the shipping industry is fundamental.

The contrast between the Royal Navy under State control and British

shipping provided by private enterprise is not generally appreciated. It may be stated in brief terms as follows :

Down to the outbreak of the First World War, the strength of the Royal Navy was maintained only as a result of repeated agitations by a succession of naval officers—Fisher, Beresford, and others, the Board of Admiralty more than once threatening to resign, and by journalists—W. T. Stead, J. R. Thursfield, Arnold White, Spencer Wilkinson, and others (*vide* F. W. Hirst's "Six Naval Panics"—Methuen).

It was so weak in the war of 1914–18 that at one time it had ready for action only one more "Dreadnought" than Germany (*vide* Bacon's "1900 and Onwards"). During the war, the Admiralty had to build 2,000,000 tons of men-of-war in order to maintain command of the sea, with the result that merchant shipbuilding had to be neglected ; as a result of Germany's intensive U-boat campaign, we came near to losing the war owing to lack of merchant tonnage (*vide* "Life of Lord Jellicoe," by Admiral Sir Reginald Bacon).

After the peace of 1919, the lessons of the war were forgotten, as has always been the case after every war, and the Royal Navy was neglected. Hundreds of men-of-war were scrapped and no new ones built to replace them ; the number of officers and men was reduced from 400,000 to 99,000, all political parties assenting.

When the present war was on the horizon, the Admiralty had to put in hand an emergency programme of 617 men-of-war, with the result that merchant shipbuilding was again neglected (only 25 per cent. of the shipyard facilities remaining for the purpose), and officers and men had to be taken from the Merchant Navy in an attempt to make good some part of the shortage of naval *personnel*.

On the other hand, the Merchant Navy, under private enterprise, greatly increased in strength from the repeal of the Navigation Laws until the war of 1914–18, when ships of 7,500,000 tons were sunk by enemy action and heavy marine casualties were suffered. Those losses were replaced *without costing the taxpayers a penny*. Year by year, under the auspices of the National Maritime Board, on which shipowners, officers, and men were represented, the pay and conditions of service of the *personnel* were steadily improved.

In the post-war years the Merchant Navy paid its way, yielding dividends, though not large dividends, on the capital invested, and its gross freights in the foreign trades in one year (1920) paid for the overseas purchases of food and raw materials to the value of £300,000,000 (Board of Trade's Statistical Department).

When the present war opened, shipowners were able to place at the disposal of the nation 21,000,000 tons of the most efficient tonnage under any flag (*vide* Mr. Winston Churchill), all the ships being manned, as well as managed, by the most expert staffs in ship management.*

Then what in summary is the position ? Experience has proved that the Royal Navy suffers from bureaucratic control, is the toy of political parties and is neglected in order that Budgets may be balanced. The Merchant Navy, though it has suffered from subsidised foreign competition, has, under skilled commercial management, maintained its primacy among the merchant navies of the world, and in time of the war has provided the Navy, Army, and Air Force with a vast volume of tonnage—trans-

* This figure, if only seagoing tonnage is included, was much too high (*vide* "Brassey," 1940).

ports, storeships, and oil tankers—without which they could not have fought.

The former has always been a burden on the taxpayers, since it is an essential form of national insurance on which annual premiums have to be paid, while the latter has not only paid its way, yielding dividends to investors, but has earned freights in the foreign trades which have enabled this country's national trading account to be balanced with a handsome credit, which has strengthened the sterling exchange. As an export industry its value in pounds sterling is greater than either coal, wool, cotton, or iron or steel. It has, moreover, enabled "Lloyd's" to maintain its position as the strongest insurance institution in existence; it has made the "Baltic" the greatest chartering centre in the world; it has provided work for Lloyd's Register which has become the most important classification society in any country, with its large expert staff in London and the "outports" and its surveyors in every considerable port overseas; and it has supported the shipbuilding and engineering industries, still supreme in output in comparison with that of any other country, when the Admiralty has had few or no orders to place.

One final point may be made. Shipowners through their organisations have affirmed that they want to raise the status of British shipping, and improve the conditions under which officers and men serve, to the economic limit of what is really a branch of a highly competitive international industry. They, like the officers and men, believe that this task can be most efficiently and successfully carried out through the National Maritime Board, and so far as the design, building and operation of the ships are concerned, private enterprise can be relied on to maintain our position as "the wagoners of the world", if the Government will give the necessary support to the united claims of owners and *personnel* in meeting the subsidised shipbuilding and ship operating of foreign nations.

POST-WAR NEEDS.

While shipowners have been co-operating to promote to the limit of economic possibilities the welfare of the seagoing *personnel*, they have been occupied with many other problems arising from Government control—the rate of hire of tonnage, its replacement, and the maintenance of an adequate volume of tonnage in the years after the war. The present rates of hire make no provision for creating reserves to meet replacement at the higher shipyard price, nor is there any margin for contingencies. But, as the Chamber of Shipping has stated, "the industry, in accepting these rates of hire, believes that, *within the narrow limits laid down by the Government*, they represent, on the whole, a fair bargain." From the point of view of maintaining the industry in efficiency after the war, however, they are wholly inadequate. The acceptance of the hire terms of the agreement with the Minister of War Transport was, in fact, a patriotic gesture in recognition of the urgent necessity of the maximum effort being made to win the war. But shipowners, in taking this short view, realised that they were endangering the chances of restoring this country's services of efficient ships on the various trade routes after hostilities closed. A large number of long view problems still remain unsolved. Summarising its negotiations with the Ministry of War Transport, the Chamber stated in its report:

"It was recognised that in war-time the State must control profits, and could not avoid paying neutral or allied shipowners a higher rate of remuneration than that which can be

allowed to British shipowners. At the same time, it was pointed out that this must greatly strengthen the competitive power of foreign shipping after the war and weaken the resistance of British shipping to it. The Chamber, therefore, urged the Government so to regulate profits as to enable the industry—so far as possible from its own resources—to maintain and expand the British Mercantile Marine in the face of such post-war competition.

"It pointed out the need for attracting fresh capital to the industry and the necessity for meeting depreciation, of which large arrears have still to be made good, while in future, the cost of building will inevitably be greatly increased, requiring a larger revenue out of which to meet it. The Chamber urged the Government to adopt a policy of 'pay as you go' and to ensure to British shipowners a remuneration which would enable them to set aside the reserves required to maintain the volume of tonnage under the British flag; such reserves to be kept for that purpose and not absorbed either in taxation or in the payment of dividends."

In his presidential address to the Chamber of Shipping, Lord Rotherwick, who, as a son of Sir Charles Cayzer, the founder of the Clan Line, may be said to have been born into the industry, pointed out :

"Shipping stands almost alone as one of the very few industries—if indeed there is another—in which the Government has abrogated to itself an almost exclusive right to replace the industrialist's plant.* The result is that while the private shipowner is losing ship after ship, the only tonnage which is being replaced is Government tonnage, and the only new building is Government building. The effect can only be to expand the mass of State-owned tonnage, and to contract the scope and extent of private ownership.

"Under such conditions, it takes a stout heart to remain a shipowner and a stouter heart to become one. It must not be forgotten that it is private enterprise, and private enterprise alone which has built up our mercantile marine, and the only support which it has actually received from the Government in this task has been £4 million in Tramp Subsidy, £3½ million so far in loans (the total of which will probably not exceed £4 million), and £300,000 paid in grants (out of a total of £500,000 sanctioned for 1940–41). Moreover, both loans and grants were primarily intended to tide the shipbuilding industry over a crisis and only incidentally to benefit the shipping industry."

Owing to the war, shipowners are losing not only ships but income. They receive, it is true, a moderate sum, on account, from insurance, when a ship is sunk, but they are deprived of the rate of hire on that unit and management expenses still continue a drain on their resources.

Unless the Government is prepared to allow shipowners to replace their losses as and when incurred, the financial resources of the industry will be gradually whittled away, and its capacity for recovery after the war will be still further endangered. The only result of that must be to increase the burden on the taxpayer, who will have to come to the rescue of an industry which the Government has been largely responsible for causing to become derelict.

The outlook of the industry thus continues overcast. Owners are endeavouring to find a safe track through the jungle, but, so far, their limit of vision has necessarily been very restricted by the undergrowth; they are forced to lead a hand-to-mouth existence, placing their confidence in the indefinite assurance of the Government that steps will be taken to re-establish the industry after the war.

ARCHIBALD HURD.

* Subsequently a few licences to build specialised types of ships were issued to shipowners.

CHAPTER IV.

AIR OPERATIONS AND THE WAR AT SEA.

HALF a dozen names serve well as fixed points from which the air operations of 1941 can be marked out, and it is at once noticeable that most of those names are referred to the war at sea. The *Scharnhorst* and *Gneisenau*; the *Bismarck*; *Malta*; *Crete* and the *Prince of Wales* and the *Repulse*; those were the names that brought into prominence all the complex problems of sea-air co-operation and served to elucidate still further some of the examples that were mentioned in *Brassey's Naval Annual* for 1941. Throughout the period under review the accent, with a few exceptions, has been on the relationship between aerial and marine work, on the drawing together of these two exceedingly complicated and scientific military activities.

It has not been demonstrated that any new principle has been discovered or that any remarkable revelation of the scope of air power has taken place; but it has been demonstrated and underlined that this is three-dimensional war or three-element war, and that there may be grave peril if there is at any time a failure to appreciate all the implications of that fact. If the views of leading officers in all three Services are examined it would seem that any iteration of this truth would be redundant; yet events prove that instances can still occur in which there appears to be, in one direction or another, a disposition to think in terms of one Service, one element or one dimension. The classic instance is strategical bombing. Some extremists—though it is fair to say that their views are not shared by the more responsible officers of the Royal Air Force—have held and still do hold that heavy and sustained bombing can win wars on its own, and that concomitant land and sea operations can be relegated to a subordinate place. There is no need to deny the power of heavy and sustained strategical bombing to hold that it cannot alone win wars. We have to admit, if we examine the events of 1941 dispassionately, that they have cast some light on this form of attack and that they have, on the whole, revealed fresh limitations rather than fresh potentialities. In fact it might be said, without forcing the facts, that the year has tended to discredit independent bombing and to reveal enhanced merits in aerial action closely co-ordinated with land or sea action. This has been a year of attacks on shipping and on harbours and on submarines and convoys.

The Bomber Command of the Royal Air Force has made a great many sorties against the enemy. Some of them have been on land targets such as *Berlin* or the *Ruhr*; but it does appear, when the whole year is seen in perspective, that its most valuable attacks were those directed against targets related to the war at sea. It made a great many such attacks, and one of its feats was to confine the German battle cruisers *Scharnhorst* and *Gneisenau* to port. It is true, of course, that the Coastal Command also played its part in this and other sea-air activities; but the Coastal Command being, as was mentioned in last year's review, under the operational control of the Admiralty, does not provide so striking an example of the two forms of air action—that taken independently and that taken as part of a combined operation—as do the two branches of the Bomber Command's work.

THREE FORMS OF AIR ATTACK.

The part played by the Royal Air Force in the war at sea was greatly enlarged during the year ; but meanwhile naval aircraft were also active, especially in the Mediterranean, and they achieved a large number of successes in varied operations. Probably the most dramatic achievement of naval aircraft—though not necessarily their most important achievement—was the part they played in the sinking of the *Bismarck* on May 27. Some details of this action will be given on account of its many remarkable qualities, but first it is useful to try and sort out the many and varied sea-air events of the year and to state their essentials in brief. The method cannot be exact, but it may perhaps help to set the extraordinary events of the year against the background of the whole war in some kind of order. We may distinguish three divisions :—

- (1) Aerial attack on ships by land-based aircraft working at short range.
- (2) Aerial attack on ships by ship-borne aircraft.
- (3) Aerial attack on ships by land-based aircraft working at long range.

So far as possible the outstanding events of the year will be kept in chronological order as they are rehearsed for the purpose of illustrating these things ; but it will be necessary here and there to depart from chronological order, and in any case there must be a grouping under these three heads and a certain amount of repetition where it is necessary to recall details of an action for the purpose of considering defence.

SHORT-RANGE LAND-BASED AIRCRAFT.

The attacks on ships by land-based aircraft were made when the ships were in port, and when they were on the high seas. In the month of April there were numerous examples of both kinds of attack, for this was the month of the withdrawal from Greece. In the previous month there had been the first heavy German raid on Clydeside, on March 13, and on the last day of March the Royal Air Force had raided the *Scharnhorst* and *Gneisenau* at Brest. Then, on April 14, the Royal Air Force again bombed Brest by night, and on April 16 it attacked Brest, Bremen, Wilhelmshaven and Cuxhaven, losing five aircraft. On April 13 and 14 it attacked enemy shipping. Naval aircraft raided Valona on the night of April 14 and blew up two ships there, and naval aircraft also co-operated with units of the Fleet in attacks on Tripoli on April 21. On this day and on the two following days, the enemy raided Plymouth. The Greek evacuation had been completed by the end of the month, and during the course of it two of H.M. Destroyers, the *Wryneck* and the *Diamond*, had been sunk by enemy dive bombers after they had rescued troops from a burning transport. In this month too occurred the remarkable action of H.M. Minesweeper "*Bassett*" which, on being attacked by four enemy aircraft, shot down two of them.

This month, therefore, may be said to have been a foretaste of things to come. The sea-air war reached its peak up to that date in the next month, May. On the first day of the month the Royal Air Force raided the enemy submarine base at Den Helder, and on May 7 it claimed to have secured hits on the *Scharnhorst* and *Gneisenau*. Then there began two of the outstanding operations of the year ; on May 20 the German attack on Crete started, and four days later the *Bismarck* was intercepted off Greenland and naval aircraft succeeded in hitting her with torpedoes. The

Crete operations have been extensively examined, but in outline they consisted of an enemy air-borne invasion with several attempts at simultaneous sea-borne invasion. Both the air-borne invasion and the attempted sea-borne invasion were linked up with the air defences which were available over the island. They proved to be inadequate. The Royal Navy, however, succeeded in defeating each successive attempt to ferry troops across to Crete by sea, though it had to work all the time without air support and therefore suffered considerable losses. The reason that air support was not forthcoming in the narrows around Crete was that the German air-borne invasion had concentrated from the start on the air bases in Crete and had succeeded in the opening stages in driving our air forces from them.

It was a grim lesson which caused concern throughout the country. That concern was centred upon whether the importance of air co-operation had been realised by our commanders, and upon whether tactical methods for the defence of aerodromes had been adequately studied. The public was intensely worried when it heard of our ships and of our soldiers being subjected to intensive and sustained dive-bombing attacks while their air defences were either wholly absent or were confined to a few long-range machines working from far away bases and fighting under conditions of extreme danger and difficulty. The importance of furnishing all ships which have to work in narrow waters with strong air support was underlined. Crete was the perfect instance of the dangers attending any attempt to work ships within reach of short-range, land-based aircraft. It was the foremost example of the first of the three divisions set out above.

SHIP-BORNE AIRCRAFT.

But the second of those divisions, namely aerial attack on ships by ship-borne aircraft, was to have its own classic example almost at the same time; and this example went in our favour. The Bismarck, Germany's newest battleship, having been intercepted off Greenland and torpedoed by naval aircraft which took off by night from H.M.S. Victorious, set off on an astonishing dash for port. Touch with her was lost during the early stages of the action when the weather was bad. Indeed, official accounts suggest that some of the torpedo attacks were made by ship-borne aircraft operating in worse weather than on any previous occasion in history. But on May 26 at 10.30 a.m. touch was regained with the ship 550 miles from Land's End and naval aircraft took off from the Ark Royal carrying torpedoes. They secured two hits. On the next day at a minute past eleven the Bismarck, after being disabled by gunfire from the King George V and Rodney, was sunk by the cruiser Dorsetshire, so that the part played by aircraft was that of slowing down the enemy vessel so that surface craft could make contact with her. The power of ship-borne aircraft against ships had been demonstrated on the high seas. The Taranto action had previously demonstrated the power of ship-borne aircraft against ships in port where the sea room was sufficient to allow torpedo attacks to be made and where the precautions against such attack were inadequate. So the essence of the Bismarck action, so far as the air is concerned, was the way in which it underlined the value of the ship-borne aircraft carrying a torpedo. The rejoicing that was felt that naval aircraft had been the prime cause of the sinking of this great German ship was moderated by the Admiralty announcement that, in the Crete operations, the cruisers Gloucester and Fiji and the destroyers Juno, Greyhound, Kelly and Kashmir

had been sunk by enemy air attack. It was also stated on the following day that the destroyer *Mashona*, which had taken part in the hunt of the *Bismarck*, had been hit by enemy bombs and had subsequently sunk. The cruiser *York* was also stated to be a total wreck as a result of enemy air attacks in Suda Bay where she was being repaired.

Divisions one and two, therefore, had had their outstanding examples by the end of May. There had been the outstanding example of *Crete* which indicated what happens when surface craft are called upon to work in narrow waters without protection from attack by short-range, land-based aircraft; and there had been the outstanding example of the *Bismarck* which indicated what happens when even the latest and best protected type of warship is engaged on the open sea by torpedo-carrying aircraft flown off aircraft carriers.

These two events must take their place in the history of war. They marked the practical test of theories which had been built up during the years of peace; they were vividly convincing; they drove home the importance of sea-air collaboration just as sharply as the collapse of France and the conquest by the Germans of Greece had driven home the importance of land-air collaboration. Before turning to the other major division that has been enumerated, it is useful to mention two smaller operations. On May 14 H.M.S. *Perfective* shot down an enemy aircraft at night and on May 15 naval aircraft played a part in the operations in Iraq, for they attacked the barracks at Samawa.

LONG-RANGE, LAND-BASED AIRCRAFT.

The most important example of the third of the major divisions mentioned above—aerial attack on ships by long-range, land-based aircraft—occurred at the end of the year; but it was a form of attack which was being employed by the Germans to an increasing extent. They were using the four-engined Focke-Wulf monoplanes, carrying bombs and usually fitted with a "box" under the fuselage containing cannon. These aircraft had become a danger to our convoys when these were still far out over the Atlantic and before they came within operational radius of Coastal Command long-range reconnaissance aircraft. From time to time the Royal Air Force had sought to hamper the enemy's use of these long-range machines by attacking the aerodromes from which they were known to work and on April 13, for example, *Mérignac* was bombed by Royal Air Force aeroplanes. But these attacks did not succeed in preventing the Focke-Wulfs from operating.

For some time there had been a considerable inventive and technical effort to devise means of dealing with these aircraft and this will be mentioned in its place; but here the problem may be briefly outlined. The long-range German machines were of relatively high performance. The Focke-Wulf used was an adaptation of an extremely advanced commercial type which had been produced shortly before the outbreak of war. It was a high-speed aircraft for its size. But clearly it had not much chance of beating off attack by fighters. In the air, performance is the first tactical requisite. The Focke-Wulf, though a good performer for its size and range, would be considered a poor performer relative to a land-based type of single-seat fighter. The consequence is that it could not, without undue risk, attempt to attack our convoys when they were within the radius of action of shore-based fighters. Some considerable efforts had been made therefore to increase the range of our shore-based fighters,

and the Beaufighter had been coming into service with a range of 1,500 miles and good fire power. But there were still large regions where the Focke-Wulfs might attack without any very marked danger of being themselves attacked by aircraft with performance superiority and this was, in fact, their favoured tactic.

They sought out our convoys—some of the methods used for finding the convoys were highly ingenious—and they tried to launch their attacks before the convoys came within practical reach of British shore-based aircraft. Their actual method of attack has been described by those who have suffered it; they usually reconnoitred the convoy at long range, then came in and conducted a species of shallow dive bombing, often preluding the release of the bombs with cannon fire with the object—apparently—of hampering the anti-aircraft gun layers in the vessel under attack. In its constant efforts to counter these attacks on British convoys by enemy long-range, land-based aircraft, the Royal Air Force Coastal Command extended its operational scope.

During the period reviewed in last year's "Brassey" Air Chief Marshal Sir Frederick Bowhill was the Air Officer Commanding-in-Chief the Coastal Command. He had held this position since the outbreak of war. But in 1941 Air Chief Marshal Sir Philip Joubert de la Ferté succeeded him with effect from June 14, while Sir Frederick Bowhill took over work connected with the ferrying of new aircraft across from the United States to England. So Sir Philip Joubert was faced with this problem of countering the attacks by Focke-Wulf aircraft in intensified and highly developed form. There was evidence of close collaboration between the German aircraft and German submarines. Two means were used in reply, first the bringing into service with the Coastal Command of a number of long-range fighters, notably the Bristol Beaufighters already mentioned and, second, the employment of catapult fighters and of fighters carried in auxiliary vessels accompanying the convoy.

SHIPS ATTACKED BY CANNON FIRE.

It was in June that the Royal Air Force intensified its attacks on enemy shipping in general, and in July, Sir Archibald Sinclair, the Secretary of State for Air, was able to point to some of the results of that work. One of the methods used for the attack on enemy ships of suitable type was with fighters. The Fighter Command of the Royal Air Force, with Air Marshal Sir Sholto Douglas as Air Officer Commanding-in-Chief, disposed increasing numbers of aircraft carrying cannon. The Vickers-Armstrongs Spitfire had been adapted to carry two cannon, one in each wing, and the Hawker Hurricane to carry four cannon, two in each wing. The cannon used were of the 20-millimetre type with a high rate of fire and a fairly high muzzle velocity. Obviously their power of damaging ships was limited to those vessels which were unarmoured. Nevertheless it was found that this form of attack, in spite of its limitations, was exceedingly successful and, in particular, it enabled the German anti-aircraft—"flak ships"—to be dealt with on many occasions. The cannon fire seemed to be adequate to damage these vessels seriously, and it was used with great boldness and at close range by the Royal Air Force fighter pilots. So here was another development—not entirely new to be sure, but having certain novel aspects—in the ceaseless contest between the air craft and the surface craft.

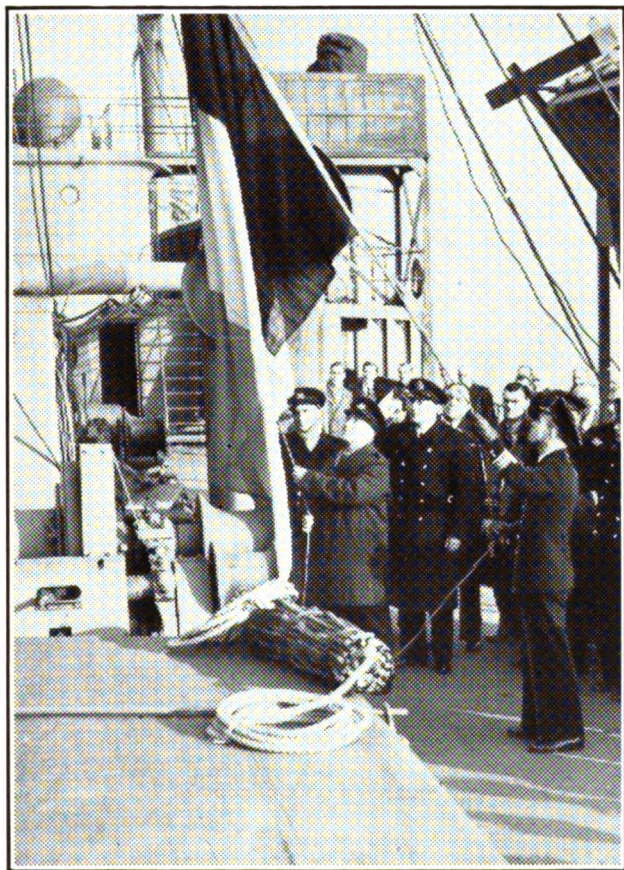
Still keeping to a rough chronological order, but at the same time trying to maintain the three main divisions laid down at the outset, we come, on

July 30 to a very courageous attack by naval aircraft on German shipping at Kirkenes and Petsamo in northern Scandinavia. This was conducted by carrier-borne machines in the face of furious enemy opposition, much of it from land-based fighters of the latest type. In the course of the action sixteen naval aircraft were lost. The German light cruiser *Bremse* was twice hit, four supply ships were hit and four enemy aircraft brought down. From then on, the Fleet Air Arm made frequent strikes at enemy bases and enemy ships, mainly, however, in the Mediterranean. On July 31, for instance, a Mediterranean convoy was attacked by night. On August 5 naval aircraft made a night attack on an enemy seaplane base in Sicily, and on the day after further attacks were made in the same region, Comiso and Gerbini being singled out. They were again the objectives of naval aircraft on many future raids and, in addition, attacks were made on Trapani and Catania.

One rather curious objective was attacked by Swordfish aircraft from the *Ark Royal* on August 26—the cork forests of Sardinia, large areas of which were set on fire. Throughout October especially naval aircraft were extremely busy. They concentrated mainly on enemy bases in Sicily, but they also included raids on El Gazala, in Libya, and on enemy convoys. All such operations must be considered as grouping with the aerial attack on shipping, either in port or on the high seas, by means of ship-borne aircraft. They were important in that they began to show the scope of ship-borne aircraft and to foreshadow the grim events of December when the Japanese entered the war. The ship-borne aircraft had never received unqualified approval from anybody. It used to be criticised alike by the Royal Air Force and by the Royal Navy. It could not be made with as high a performance as the land-based machine, and the eyes of the world had not yet been opened to the extra value which was artificially conferred upon the ship-based aircraft by virtue of the mobility derived from its floating and moving base.

The ubiquity and success of the naval aircraft working from carriers was a first hint of things to come. Unfortunately those things were to come from the enemy, for it must be freely acknowledged that in 1941 the outstanding contribution to sea-air collaboration was made by the Japanese with their extraordinarily ambitious operations by carrier-borne aircraft. The carrier was used by the Japanese in December not so much as a means of giving the Fleet mobile protection, as a means of creating bases thousands of miles from the main centres of supply and then working from them offensive short-range aircraft with big bomb loads and with torpedoes. It was the *Bismarck* action magnified. The aircraft carrier was beginning to emerge from the cloud under which it had first appeared, and had tended to remain ever since. The Royal Navy had proved the value of the aircraft carrier for defence and its value for tackling enemy warships on the high seas; but it was left to the Japanese to use the aircraft carrier as a stepping stone not only to these things, but also to bombing assaults at close range on harbours, ports and cities separated by thousands of miles from the nearest land bases. Pearl Harbour on December 7 was, when it is looked at in the broadest way, the offspring of the Taranto action. The sinking of the *Prince of Wales* and the *Repulse* on December 10 were direct imitations on a larger scale and with fuller success of the sinking of the *Bismarck*.

Even here, however, the mode of attack was not new. It was thought at first that the Japanese had employed "suicide" tactics and had bombed



A new Mercantile Fleet. Taking over a new motor ship in a British port for the Belgian Mercantile Marine.



Convoy protection in the Mediterranean. A British cruiser shoots down an Italian bomber.
(*British Official photograph.*)

the ships from close range ; but this early report was discounted by those who kept in mind the fact that an air bomb, when launched from close range, does not have time to acquire the velocity needed to penetrate the kind of armour with which ships like the Prince of Wales and the Repulse are protected. And it later became known that the Japanese attack consisted of a high level bombing attack and an attack by air-borne torpedoes. The air-borne torpedoes were the instruments which succeeded in sinking the ships and not the bombs. In fact the evidence is that the bombing did not do much serious damage though it may have hampered the anti-aircraft gunners. But the air-borne torpedoes, launched by aircraft which had the benefit of the diversions created by the high level bombing attacks, were decisive. It is worth noting here in passing that General William Mitchell of the United States Army in his book "Winged Defense," which was published in America about 1925, incorporated a diagram which almost exactly stated the tactical method employed by the Japanese in this attack on our ships sixteen years later.

The sinking of the Prince of Wales and the Repulse followed the Japanese attack on Pearl Harbour by three days. It is difficult to determine just how much assistance the Japanese derived in their attack on the United States naval base from treachery and how much the effects secured were the outcome of clever tactics. Some comment on this is to be found in the findings of the commission.

It is positive that it was a remarkably ambitious attack which would almost certainly have met greater opposition if it had not had the assistance of a very elaborate smoke screen of treachery, and if there had been greater vigilance by senior officers of the U.S. Navy. While the Japanese aircraft carriers were moving to the scene—there were three or four of them—the Japanese diplomatists were busily engaged on lulling American suspicions and on giving the impression that even if Japan intended to make war, she did not propose to do so immediately. It has been said that commanders must not allow their vigilance to be in any way influenced by political events ; but such independence is rare. The Japanese aircraft carriers were able to take up their positions in readiness for the attack of December 7 without being observed, and so the attack was particularly sharp. First reports spoke of 1,500 killed and about the same number wounded with considerable damage to units of the American fleet. It has been mentioned that the attack on Pearl Harbour seemed to be the action at Taranto magnified. The Japanese were not innovating ; but they were certainly developing on a remarkable scale. They were vastly increasing the scope and range of ship-borne aircraft ; and they were increasing the striking power of aircraft against ships.

It had been known for long that the Japanese had been concentrating a great deal of attention on the development of naval aircraft and of Fleet Air Arm operations in general ; but even so the examples of their work came as unpleasant confirmation. But when regarded soberly, they merely underlined once more the need for the closest collaboration of ships and aircraft, and for the need for the use of protective fighter patrols when ships are called on to work within easy reach of short-range, land-based machines. If we may borrow the jargon of the mathematical physicists we may say that war had now been finally and fully demonstrated to be a three-dimensional continuum. Any attempt to express it in terms of only one dimension—sea alone or air alone—was doomed to failure. The lesson was driven home again and again, and with increasing clarity and increasing

urgency. Unfortunately it was once or twice in danger of being obscured by attempts to resurrect the old two-service or three-service controversy. But no responsible critics suggested the dividing up of the Royal Air Force. What was suggested and with full weight was a closer linkage between air and sea and air and land, and a recognition by all commanders—sea, land and air—that the combined effort of two Services working in close collaboration is greater than the sum of their individual efforts.

U.S. NAVAL AIR SERVICE.

With the Japanese attack on Pearl Harbour of December 7, the United States came into the war, and it is therefore appropriate to conclude these remarks with a brief note on some features of United States naval aviation. Colonel Frank Knox, the Secretary of the Navy, had stated that the projected "two-ocean" Navy would be a balanced force of ships and aircraft, and claimed that the United States Navy had never under-estimated the importance of aviation in sea warfare. And indeed that claim is justified by history. It was in January, 1911, that Eugene Ely made an experimental landing with a biplane on an improvised deck on U.S.S. *Pennsylvania*, and the development since then was fairly steady.

Rear Admiral John Henry Towers, Chief of the Bureau of Aeronautics, the United States Navy, has emphasised that "aviation is inseparably woven into the structure of our Navy as a whole. Its mobility is derived primarily from the mobility of the surface units of the Fleet." It is a consequence of this view that United States naval aircraft can all be considered as extensions of various kinds of surface craft. Before the outbreak of war the aim of the United States Navy was 3,000 aircraft; afterwards it was raised to 15,000. They range from large flying-boats to small ship-borne fighters. The Consolidated Catalina, which has given such good service with the Coastal Command of the Royal Air Force, is used by the U.S. Navy, as are the Martin Mariner, a twin-engined patrol bomber, the four-engined Consolidated Coronado and the four-engined Vought-Sikorsky XPBS-1—the last being an experimental machine. Another experimental type is the Martin Mars, one of the largest flying-boats ever built. The hull forms of many of these flying-boats were the outcome of tank tests which were started by the U.S. Navy as far back as 1911, and which were supplemented by the work done in Britain for the Royal Naval Air Service with craft such as the Felixstowe flying-boat.

U.S. Navy fighters have developed in an individual manner; characteristic types—not closely paralleled by any British machines in this tactical group—being the Brewster Buffalo and the Grumman Martlet, the latter being called the Grumman Wildcat in America, though it does not differ substantially from the British version. These fighters were a change from the earlier Curtiss Hawks which were operated from the carriers *Lexington* and *Saratoga*. Both the Buffalo and the Wildcat have a top speed of more than 300 miles an hour, and the more recent Vought-Sikorsky Corsair is stated to be a great deal faster than this. The twin-engined Grumman Skyrocket, a most unusual design, with the nose of the fuselage behind the leading edge of the wing, was built as an experiment, but it has not yet emerged whether it is to be used as a standard Service type.

No class of ship-borne aircraft has proved more important than the torpedo-carrier. The Royal Navy has been using two types, the Sword-

fish and the Albacore, both of them biplanes. It seems—though there is no confirmation of this—that the Japanese are also using a biplane for their torpedo work, and that it was a formation of torpedo-carrying biplanes that attacked the Prince of Wales and the Repulse. The United States Navy, however, has developed an exceedingly interesting and important monoplane for this work. It is the Douglas Devastator, and it is classed as a torpedo bomber. It is a sturdy monoplane which succeeded the Martin T4M. No performance figures have been released at the time of writing, but it is obvious from an inspection of illustrations of the Devastator that it should be a great deal faster than any of the earlier biplane types of torpedo carrier. This would not be such an advantage if there had not been a parallel advance in the technique and equipment for torpedo dropping. Earlier torpedo dropping demanded a comparatively low speed and placed a stringent limitation on the maximum allowable height. Now it has become possible to do torpedo dropping with accuracy at a higher speed and at a slightly greater height. The consequence is that a faster aircraft like the Devastator is of value. One other thing must be noted about this machine. A problem in all ship-borne aircraft is concerned with taking the aircraft below to the hangar down the special lifts. The limitations on wing span imposed by the lifts made it difficult in the past to design monoplanes which could be operated conveniently, owing to their greater span than biplanes. The difficulty was overcome by wing-folding devices and the Devastator shows a particularly ingenious wing folding device, the wings "breaking" about half way along the semi-span and folding upwards.

The "scout bomber" is a type of aircraft specially adapted for the United States Navy and more familiar to us as a ship-borne dive bomber. Incidentally it may be mentioned that the method of naming U.S. naval aircraft is a dual one. The names "Buffalo," "Wildcat" and the like are for general use; but there is also a series of symbols for official use. Thus the patrol bomber carries the letters PB and the Catalina may be referred to as the PBY-5. The Buffalo, being a fighter, may be called the F2A-1 and the type we are now concerned with, the scout bomber, may bear in its official designation the letters SB. Much credit belongs to the United States Navy for the manner in which it has developed dive bombing. The famous Curtiss "Helldiver" was the machine earlier used for much of this work, and it has now a modern counterpart, a monoplane with 1,700 horse-power engine, and many important new features.

Besides the main operational types mentioned, the U.S. Navy disposes many other types, including aircraft for catapulting, training and transport. And it is to be noted also that the Americans have never entirely abandoned the airship for naval work. It retains a number of blimps for reconnaissance and patrol duties, though whether they will be able to play a very active part in the present war remains to be seen. It should be added that there are, in the United States naval organisational structure, the Marine Corps and the U.S. Coast Guard, both equipped with aircraft of various types.

It will be seen that the United States and Britain together have paid attention to the aircraft as an extension of the surface vessel, and have studied its tactical use with the fleet. The equipment has been built up in accordance with experience, and the two navies possess great striking power in the air. By the end of the year under review, that power had been manifested only in the Atlantic and in the Mediterranean. In the

Pacific only the Japanese had demonstrated the capabilities of the ship-borne aircraft. Innumerable considerations affect the position there, and determine whether the naval air power of the United States or of Britain can be brought to bear ; but enough has been said on the technical equipment of the two navies to show that, if it can be brought to bear, it should be able to give some assistance in adjusting the position in the Far East. There more than in any other theatre mobility is the keynote for tactical success in the air. The air arms of the great navies enjoy mobility. The very thing that handicaps them when they are in the air, helps them when it comes to movement. It is established and accepted that the ship-borne aircraft cannot show a performance as good as the comparable land-based aircraft. The special needs inseparable from deck work limit the designer, and prevent him from going uncompromisingly for high speed or great climbing power, or extreme range. The carrier itself has been the most abused type of surface craft. Yet the outbreak of war in the Pacific has suddenly and sharply transformed the position of the carrier and of the ship-based aircraft. It becomes clear at once that the mobility conferred upon the ship-based aircraft by the carrier may prove to be so valuable that it outweighs the disadvantages to the aircraft itself of having to work from a deck.

We have to admit that the anxieties of the situation in the Pacific have been revealing. They have cast new light from a fresh angle on sea-air co-operation. They have emphasised and iterated past lessons, and they have disclosed new advantages in the ship-aircraft combination. The important thing for the future is that such lessons may be examined and advantage taken of them without any disturbance of inter-Service relationships. The habit of objective criticism must be cultivated in all considerations of air work, and there must in the future be complete absence of recurrent jealousies and fears as between one Service and another. Although in the past, the official view has insisted that all discussions on inter-Service co-operation have taken place in a truly co-operative spirit, he would be blind indeed who failed to notice signs of tension here and there. Yet as the importance of inter-Service collaboration grows, so the importance of free discussion and of absence of rivalry grows too.

The devoted loyalty of the officers and men of all three Services is such that it is possible confidently to look forward to that close and willing collaboration which the air operations at sea have shown to be so urgently necessary. There is scope for the fuller development of naval aircraft and of the methods of using them ; there is scope for the fuller development of coastal aircraft and the methods of using them and, above all, there is scope for the fuller development of the co-operation between naval, coastal and land-based aircraft and between these and surface vessels. Nothing must be permitted to stand in the way of the clearest thinking and the sharpest and most vigorous action in the furtherance of these requirements. That is the great central point on which all the major air operations at sea converged during the year 1941.

OLIVER STEWART.

CHAPTER V.

THE UNITED STATES NAVY.

ON December 7, 1941, Mr. Secretary Knox made his annual report on the Navy to the President, as Commander-in-Chief of the Armed Forces of the United States. The report is too long to reproduce in full—the original occupied 58 pages—but the gist of it is contained in the following summary, which was issued from the Navy Department as a “ Press Release ” at the time of the publication of the Report.

Colonel Knox began by assuring the President that the United States had now reached the position of being the greatest naval power in the world, and went on :—

“ I am proud to report that the American people may feel fully confident in their Navy. In my opinion, the loyalty, morale, and technical ability of the personnel are without superior. On any comparable basis, the United States Navy is second to none.

“ The international situation is such that we must arm as rapidly as possible to meet our naval defence requirements simultaneously in both oceans against any possible combination of powers concerting action against us. Our aim must always be to have forces sufficient to enable us to have complete freedom of action in either ocean while retaining forces in the other ocean for effective defence of our vital security. Anything less than this strength is hazardous to the security of the Nation and must be considered as being unacceptable—as long as it is within our power to produce and man the forces necessary to meet these requirements.”

MANNING OF THE FLEET.

Dealing with personnel, Colonel Knox reported that the measure of effectiveness of a man-of-war is determined by the efficiency of its personnel. Leadership, morale, and adequacy of personnel properly trained are paramount in the determination of fighting strength.

The complement of a ship is the number of officers and men of varying degrees of individual skill and experience necessary to meet the demands for battle. The allowance of a ship is the number of men and officers that can be assigned to a ship, which is dependent upon appropriations available in time of peace. The allowance, normally, is less than the complement, but the nearer the peacetime allowance approaches the complement, the nearer the ship is maintained at its maximum battle efficiency. In time of peace the Navy may operate with a shortage of personnel, but the price of such shortage should be clearly understood as unreadiness for war.

Sufficient funds were appropriated for the fiscal year 1941 to allow an average enlisted strength of 197,040, beginning the year with 144,824, and ending with 264,123. This appropriated strength which provided for the assignment of 37,545 enlisted men of the Naval Reserve, 8,600 members of the Fleet Reserve, and 650 retired enlisted men, on active duty was not reached by June 30, 1941, the actual strength on that date being 206,018 regulars, 941 retired enlisted men, 9,142 Fleet Reserves, and 28,505 other reserves making a total of 244,606.

The number of enlisted men allowed by appropriations for 1941 permitted their assignment in accordance with the complement of all ships for

the first time since World War I. The percentage of allowance to complement in the fiscal years 1939 and 1940 was 85.6 and 87.2, respectively, and on June 30, 1941, was 100.

The ship construction programme now under way necessitates the training, in advance of commissioning of such ships, of large numbers of personnel. It is imperative that the demands on the active fleet for men to assist in manning these ships be kept at a minimum. As many men as can be efficiently accommodated in combatant ships, in excess of complement, will, therefore, be so assigned in order that personnel for new construction can be properly trained in advance.

On July 19, 1940, legislation was enacted to expand the fleet by 70 per cent. and to increase the total number of planes to be maintained to 15,000. It was necessary, therefore, to increase the authorised enlisted strength allowed by law. Accordingly, on April 22, 1941, legislation was enacted which increased the authorised enlisted strength of the active list of the regular Navy to 232,000 men. This legislation also provided for an increase in authorised strength, upon the declaration of a national emergency, to 300,000 regular enlisted men. Authorised strength was defined to mean the total enlisted men of the Navy authorised by law, exclusive of the Hospital Corps.

Until October 5, 1940, personnel of the Naval Reserve were ordered to active duty on a voluntary basis only. On that date, however, the Secretary of the Navy placed all Organised Reserve divisions and aviation squadrons of the Organised Reserve on short notice for call to active duty and granted authority to call Fleet Reservists as necessary. Mobilisation of all Organised Fleet and local defence divisions of the Naval Reserve was completed on June 1, 1941.

On May 27, 1941, the President proclaimed the existence of an unlimited national emergency, and on June 12, 1941, instructions were issued placing all Naval Reservists, not in a deferred status, on active duty.

OFFICER PERSONNEL.

The officer personnel, though capable in ability, has been inadequate in numbers to meet the growing demands incident to the expansion in ships and planes. Studies indicate that some 26,000 line officers, regular and reserve, including aviators, will be required to adequately man the expanded Navy. In order to meet the demands, legislation was recommended, and enacted, which authorised the maintenance of the Naval Academy on a 5-appointment basis with a reduction in the course at the Naval Academy, until August 1, 1945, from 4 to 3 years. Studies indicate that with the Naval Academy operating on a 5-appointment 3-year basis, the officer requirements of the Regular Service can be adequately met. The fiscal year 1945 should be the peak year in manning requirements. It should be unnecessary, after that year, to continue the shortened course.

To augment the Naval Academy as the source of supply of regular aviators, legislation was enacted on August 27, 1940, which authorises the appointment to the Line of the Regular Navy and Marine Corps of naval aviators of the Naval and Marine Corps Reserve. A total of 328 naval aviators were commissioned in the line of the Regular Navy from this source.

Legislation approved October 8, 1940, authorises the appointment to

commissioned rank in the Line of the Regular Navy of those officers of the Naval Reserve who were commissioned therein upon graduation from the Naval Reserve Officers' Training Corps. Because of eligibility requirements no officers were commissioned from this source during the year. About 25 such officers became eligible for appointment on June 30, 1941. Those recommended will be commissioned during the fiscal year 1942.

Hearings were pending before the Naval Affairs Committee of the House of Representatives on a bill which, if enacted, would authorize officers of the Naval Reserve, commissioned therein while holding the rank of midshipman in the Naval Reserve, to be appointed to commissioned rank in the Line of the Regular Navy under regulations to be prescribed by the Secretary of the Navy. The advantages of such a bill were twofold. First, it would provide an additional incentive for personnel to enroll as midshipmen in the Naval Reserve, and, second, it would assist the Navy in meeting the immediate requirements in the lower grades in the Line of the Navy in its current expansion. The Navy Department recommended enactment of this bill and was advised by the Bureau of the Budget that there would be no objection to the submission of such recommendation. It was expected that hearings would be held in this connection some time after September 15, 1941.

By the graduation of the Class of 1941 at the Naval Academy, and the appointment of naval aviators in accordance with the act of August 27, 1940, a net gain at the end of the year, over the accumulated losses throughout the year, of 459 line officers, resulted in a total of 7,670 line officers on June 30, 1941. The several staff corps increased by 183, and the warrant grades by 883.

Legislation approved July 24, 1941, authorizes the temporary appointment to ranks or grades in the Regular Navy, not above lieutenant, of commissioned warrant and warrant officers and chief and first-class petty officers. The act also authorizes the temporary promotion or advancement of officers of the active and retired list.

Likewise, to increase the source of supply of Naval Reserve officers, legislation was enacted to authorize the increase in number of students at Naval Reserve Officers' Training Corps schools from 2,400 to 7,200.

With the enactment of pending legislation and the recall to active duty of all reserve and retired personnel, it was anticipated that the requirements for officer and enlisted personnel, afloat and ashore, could be adequately met.

The morale of naval personnel continued to be of the highest order. Recruiting in the Regular Navy continues on the 6-year enlistment basis and for minority.

The fiscal year 1941 witnessed the virtual transition of the Nation from a peacetime to a wartime footing, with tremendous industrial expansion for production of war material. Much of this expansion was keyed to the needs of military and naval aeronautics. The Navy's authorized airplane complement alone was increased from 10,000 to 15,000, and the appropriations for "Aviation, Navy," were four times as great as in 1940. While plans were set in motion to procure these airplanes, mobilization of the Naval Reserve was accomplished, thousands of new students being enrolled for aviation training, and additional aviation shore establishments and operating units being established. In design of aeronautical equipment and training of personnel, the lessons of the European war were rapidly absorbed and applied. New joint programmes with the Army

were formulated. Adjustments for the unprecedented defence aid activities were made. The application of critical priority schedules for aeronautics was undertaken. At the fiscal year end, satisfactory progress toward the realisation of all objectives was reported.

During the year, there was established in the Office of the Secretary of the Navy an Office of Budget and Reports charged with such duties pertaining to naval budgetary matters and statistical and work reporting as may be prescribed by the Secretary of the Navy.

EXPANSION PROGRAMME.

He described graphically what he termed "satisfactory progress" in the greatest programme of expansion attempted by the Navy since its establishment in 1775—or by any other navy in world history.

Among the accomplishments cited by Secretary Knox was the commissioning of 325 new ships, the acquisition of 2,059 new airplanes, the beginning of a chain of new bases to give the Nation a first line of defence extending far out into both oceans, and net personnel increases totalling 15,259 officers and 100,282 enlisted men.

"The operations of the United States Naval Forces during the fiscal year 1941 have, of necessity, been determined by the demands of the national emergency," he told the President. "Every effort has been directed toward increasing the strength of the Fleets in order to accomplish the fundamental United States naval policy of maintaining a Navy in strength and readiness to uphold the national policies and interests, and to guard the United States and its continental and overseas possessions.

"Pursuant to the fundamental policy, the employment of forces has been effected with the fulfilling of the following supplemental policies in view :

"To develop the Navy to a maximum in fighting strength and ability to control the seas in defence of the Nation and its interests ;

"To make effectiveness in war the objective of all development and training ;

"To organise and maintain the Navy for major operations in both the Atlantic and Pacific Oceans."

One of the principal steps in this direction, his report showed, was the abolition of the United States Fleet as such on February 1, 1941, and its reorganisation into three units—the Pacific Fleet, the Atlantic Fleet and the Asiatic Fleet.

His report on shipbuilding during 1941 revealed that legislation enacted by Congress authorised new combatant ship construction totalling 1,434,300 tons ; auxiliary, patrol and miscellaneous vessel construction amounting to 725,000 tons, and the acquisition, conversion or alteration of 51 other auxiliaries of unspecified tonnage.

In service during the whole or part of 1941 were 907 ships, 681 at sea and 226 in naval districts and stations. Of those at sea, 356 were in commission during 1941.

Because of the need for additional patrol craft several Coast Guard cutters reported for duty with the Navy, the first of these on October 1, 1940, and performed naval duties throughout the remainder of the fiscal year.

The Navy took over 237 vessels for conversion into auxiliary, district and patrol craft and 109 of these conversions were completed as of the end of the fiscal twelvemonth on June 30, 1941.

On that date 697 vessels were on the building ways, 608 in private yards, and 94 in Navy yards. The year began with 12 private yards engaged in building for the Navy, and at the close 108 such yards were turning out vessels, not including five which received and completed contracts for Diesel propulsion machinery for ships.

TRANSITION TO WARTIME FOOTING.

"The fiscal year 1941," the Secretary asserted, "witnessed the virtual transition of the Nation from a peacetime to wartime footing, with tremendous industrial expansion for production of war material. Much of this expansion was keyed to the needs of military and naval aeronautics. The Navy's authorised airplane complement alone was increased from 10,000 to 15,000 and the appropriations for 'Aviation, Navy' were four times as great as in 1940."

"While plans were set in motion to procure these airplanes, mobilisation of the Naval Reserve was accomplished, thousands of new students being enrolled for aviation training, and additional aviation shore establishments and operating units being established. In design of aeronautical equipment and training of personnel, the lessons of the European war were rapidly absorbed and applied. New joint programmes with the Army were formulated. Adjustments for the unprecedented defence aid activities were made. The application of critical priority schedules for aeronautics was undertaken. At the fiscal year end, satisfactory progress toward the realisation of all objectives was reported."

The 2,059 new planes obtained—contrasting with 306 added in 1940—gave the Navy 3,926 aircraft, an increase of 82 per cent. in plane strength. Emphasis was placed on dive bomber and fighter types with greater engine power and improved propeller design and on increase in the relative complement of patrol bomber types. Three new seaplane tenders and eight small patrol plane tenders were acquired.

Pilot personnel increased 48 per cent. At the year's close 3,104 aviation students were in training, more than half of them assigned to instruction in patrol plane operation. The training of pilots and extension of patrol areas to enforce the Neutrality Act brought about a 50 per cent. increase in the number of hours flown by Navy planes.

The number of naval air stations was increased to 13 and on three new stations—Jacksonville and Miami, Fla., and Corpus Christi, Texas—major training centers were set up. Three new Naval Reserve aviation bases at Atlanta, Ga., Dallas, Texas, and New Orleans, La., brought the total of these bases to 16. Four new aviation trade schools were created.

Secretary Knox also said that parachute troop and glider programmes were inaugurated and that they are proceeding satisfactorily.

The year saw an unprecedented expansion of naval shore establishments, made necessary by the large expansion of forces afloat and in the air. A number of the new bases are located on sites obtained from Great Britain in 1941 in exchange for 50 overage destroyers.

Base-development funds authorised for obligations during 1941 amounted to approximately \$1,100,000,000 and a total of 712 contracts involving shore construction were awarded at a cost of \$603,199,632. Many of these items were completed, and excellent progress is being made toward the completion of others urgently needed to meet requirements of the striking forces.

Naval air stations have been completed or advanced to such a stage as to permit operations at 11 continental and 18 island and overseas bases, Secretary Knox stated. Construction work is actually under way for additional overseas bases.

The geographic positions of the chain of air bases in the Atlantic make them of the greatest strategic importance. As they control vital routes to the United States, the Gulf of Mexico and Caribbean Sea, and guard the approaches to the Panama Canal, every effort is being made to expedite their completion.

In the Pacific, the strategic importance of the air bases in Alaska, and the Aleutian Islands, together with development of the islands guarding the approach to the Navy's defences in the Hawaiian area with the resultant safety of the Pacific Coast, are obvious, he said.

The report showed that in connection with such development work, 17,583 family housing units, together with dormitories for 2,000 single men, were completed at a cost of approximately \$62,000,000. This substantially completes the low-cost defence housing programme allocated to the Navy by the President.

The report revealed that the Navy began 1941 with 13,162 officers and 144,824 enlisted men on active duty, and that at the end of the year it had in service 28,421 officers and 244,606 enlisted men.

Secretary Knox detailed the many steps taken to obtain and train personnel, and said that "with the enactment of pending legislation and the recall to active duty of all reserve and retired personnel, it is anticipated that the requirements for officer and enlisted personnel, afloat and ashore, can be adequately met."

The U.S. Marine Corps' authorised strength, set at 1,563 officers and 29,500 enlisted men at the outset of 1941, was raised to 2,568 officers and 43,180 men by the year's close.

Morale and health of personnel in the Naval service were excellent, he added.

Two officers and 31 enlisted men perished in the lone catastrophe of the year, the sinking of the submarine USS O-9 while it was on a trial run off the Isle of Shoals (Portsmouth, N.H.) on June 20, 1941.

Secretary Knox discussed aids to labour during 1941 and cited the new schedule of wages governing the pay of civil employees in the field service of the Navy Department put into effect on November 18, 1940.

In the field of research and development of projects, Secretary Knox said, the Navy undertook 341 research problems and 276 development projects.

Reviewing the fiscal aspect of Naval activities during 1941, Secretary Knox showed in his report that in the regular budget funds available for expenditure totalled \$4,019,919,458.23; expenditures recorded, \$3,255,294,122.25, and obligated, \$11,379,292,952.33. Estimated available for expenditure in 1942 are funds totalling \$7,340,190,994.25 with expenditures estimated at \$5,852,397,595, and obligations estimated at \$7,534,868,605.

Under defence housing funds, \$49,019,000 was allotted and available for expenditure in 1941. The unexpended balance as of June 30, 1941 was \$16,244,162.86, leaving \$32,774,837.14 in 1941 recorded expenditures. Obligations unpaid as of June 30, 1941, were \$15,208,618.53, making \$47,983,455.67 obligated during 1941. Unexpended balances of amounts allotted prior to July 1, 1941 was \$16,244,162.86, available for expenditure

in 1942. Estimated expenditures for 1942 total the same and obligations unpaid July 1, 1941 amount to \$15,208,618.53, leaving estimated obligations for 1942 at \$1,085,544.83.

During 1941 the Bureau of Supplies and Accounts, faced with a continued increase over previous years in the demands for supplies and materials for the prosecution of the shipbuilding and aircraft programme and the promotion of national defence, executed contracts aggregating \$2,196,980,630.51, representing an increase of about 800 per cent. over 1940.

THE ATTACK ON PEARL HARBOUR.

On the same day that the above report was dated, occurred the surprise attack by the Japanese on the main American Naval base at Pearl Harbour, Hawaii, and the United States forces assembled there. Within a few days, Colonel Knox had himself gone by air to Pearl Harbour to investigate on behalf of the President what happened there. He returned immediately his investigation was complete, and on the morning of December 15 he made a full report to the President. That report was, of course, not made public, but later in the same day he issued the following statement.

My inspection trip to the island enables me to present the general facts covering the attack which hitherto have been unavailable.

1. The essential fact is that the Japanese purpose was to knock out the United States before the war began. This was made apparent by the deception practised, by the preparations which had gone on for many weeks before the attack, and the attacks themselves, which were made simultaneously throughout the Pacific. In this purpose the Japanese failed.

2. The United States services were not on the alert against the surprise air attack on Hawaii. This fact calls for a formal investigation, which will be initiated immediately by the President. Further action is, of course, dependent on the facts and recommendations made by this investigating board. We are all entitled to know it if (a) there was any error of judgment which contributed to the surprise, (b) if there was any dereliction of duty prior to the attack.

3. My investigation made clear that after the attack the defence by both services was conducted skilfully and bravely. The Navy lost—

- (a) The battleship *Arizona*, which was destroyed by the explosion of, first, its boiler and then its forward magazine due to a bomb, which was said to have literally passed down through the smokestack ;
- (b) The old target ship *Utah*, which has not been used as a combatant ship for many years and which was in service as a training ship for anti-aircraft gunnery and experimental purposes ;
- (c) Three destroyers, the *Cassin*, the *Downes*, and the *Shaw* ;
- (d) Minelayer *Oglala*. This was a converted merchantman formerly a passenger ship on the Fall River Line and converted into a minelayer during the World War.

The Navy sustained damage to other vessels. This damage varies from ships which have been already repaired and are ready for sea, or which have gone to sea, to a few ships which will take from a week to several months to repair. In the last category is the older battleship *Oklahoma*, which has capsized but can be righted and repaired. The entire balance of the Pacific Fleet with its battleships, aircraft carriers, its heavy cruisers, its light cruisers, its destroyers and submarines are uninjured and are all at sea seeking contact with the enemy.

4. The known Japanese material losses were 3 submarines and 41 aircraft.

5. Army losses were severe in aircraft and some hangars, but replacements have arrived or are on their way.

6. The up-to-date figures of Navy killed and wounded are : officers, 91 dead and 20 wounded ; enlisted men, 2,633 dead and 636 wounded.

THE PRESIDENT'S ACTION.

As a result of Colonel Knox's report the President took the following action.

The three officers who were responsible for the defences of Hawaii on the day of the Japanese surprise attack—Admiral Husband E. Kimmel, Commander-in-Chief of the Pacific Fleet, and of the United States Fleet ; Lieutenant-General Walter C. Short, commander of the Hawaiian department of the Army ; and Major-General Frederick L. Martin, Commander of the Hawaiian Air Forces under General Short—were relieved in their commands by Rear Admiral Chester W. Nimitz, Lieutenant-General Delos C. Emmons, and Brigadier-General C. L. Tinker.

Mr. Stimson, Secretary of War, stated in explanation of this action " These changes are made in view of the preliminary report of the Secretary of the Navy, with whose views as to the unpreparedness of the situation on December 7 the Secretary of War concurs, and to expedite the reorganisation of the air defences in the islands.

" This action avoids a situation where the officials charged with the responsibility for the future security of this vital naval base would otherwise at this critical hour also be involved in the searching investigation ordered by the President."

Admiral Nimitz had been up to then Chief of the Bureau of Navigation in the Navy Department. It was stated that until his arrival in Hawaii, Vice-Admiral Pye, hitherto Second in Command of the Pacific Fleet, would exercise command. The qualifications of the two Army officers now appointed were significant. General Emmons was Chief of the Air Force Combat Command ; General Tinker had been in command of the Third Interceptor Command in Florida. It was thus clear that there would be no neglect of the air element in the defence of Hawaii in the future.

HOW THE NAVY FOUGHT.

After his formal statement regarding the result of his investigation, Colonel Knox gave to the press the following details of individual meritorious action.

" In the Navy's gravest hour of peril, the officers and men of the fleet exhibited magnificent courage and resourcefulness during the treacherous Japanese assault on Pearl Harbour. The real story of Pearl Harbour is not one of individual heroism, although there were many such cases. It lies in the splendid manner in which all hands did their job as long as they were able, not only under fire but while fighting the flames afterward and immediately starting salvage work and reorganisation.

" Prompt action saved many lives and a vast amount of material. Without exception, all ships and stations rose to the emergency. Less than four minutes after the first alarm, guns of the fleet went into action against enemy aircraft. Seconds later the first Japanese plane was shot down.

" To a recruit seaman aboard a battleship probably goes the honour of

striking the first telling blow in the fleet's defence. Even before general quarters sounded, this youngster single-handedly manned a machine gun and blasted an attacking torpedo plane as it levelled against his ship.

"The dying captain of a battleship displayed the outstanding individual heroism of the day. As he emerged from the conning tower to the bridge, the better to fight his ship, his stomach was laid completely open by a shrapnel burst. He fell to the deck. Refusing to be carried to safety, he continued to direct the action. When the bridge became a blazing inferno, two officers attempted to remove him. But he ordered them to abandon him and save themselves. The latter found themselves blocked by the flames. Only the heroic efforts of a third officer enabled them to escape. He climbed through the fire to a higher level, from which he passed one line to an adjoining battleship and another to his trapped shipmates. By this frail means they made their way to safety.

"Entire ship's companies showed exemplary valour and co-ordination.

"Drama was thus crowded into a few seconds on board an aircraft tender moored at the Naval Air Station, target of the enemy's fiercest bombing and strafing. With the ship already on fire from repeated high altitude attacks, her anti-aircraft batteries downed a plane, which crashed in flames on deck. At this moment her captain observed the shadow of an enemy two-man submarine approaching within a few yards of the vessel. It was placed under fire. Hits were scored immediately and the submarine exposed her conning tower. At that instant a destroyer stood down channel, passed directly over the submarine, and sank it with depth charges. Doubtless saved from this craft's torpedoes, the tender then shot down a second plane, which fell on land nearby.

"Men fought with the cool confidence that comes from complete indoctrination for battle. In one case, a single bluejacket manned a 5-inch anti-aircraft gun after his 10 battery mates had been shot down by a strafing attack. He would seize a shell from the fuze-pot, place it in the tray, dash to the other side of the gun, and ram it home. He would then take his position on the pointer's seat and fire. After the third such round, a terrific explosion blew him over the side of the battleship. He was rescued.

"At the several Naval Air Stations attacked, crews dashed into the flames enveloping planes set ablaze by incendiaries, stripped off free machine guns, and with them returned the enemy's fire. In at least one instance an enemy craft was shot down.

"Two cruiser scouting seaplanes, their speed and manoeuvrability reduced by heavy pontoons, destroyed an attacking Japanese pursuit ship of thrice their speed.

"Simultaneously throughout the Navy Yard examples of personal heroism developed. Several workmen of Japanese ancestry deserted their benches to help the Marine defence battalion man machine-gun nests. Two of them, with hands blistered from hot gun barrels, required emergency treatment.

"Cool as ice, the men who manned the Navy Yard Signal Tower, from which flashed orders to the anchored fleet, carried out their assignment under a hail of machine-gun fire and bombs from the enemy, as well as shrapnel from their own force's anti-aircraft batteries. None left his dangerous post. First to observe the invaders through their long-glasses from their high vantage point, they sent out the astounding air raid warning by visual signals. Then they settled into the complex business of

transmitting the scores of orders to the ships that fought back at the attackers from their berths, or prepared to stand out to sea.

"Men from ships out of action managed at any cost to return to the battle. There were the survivors of the capsized ship, who swam through blazing oil to clamber aboard other ships and join gun crews. Crews from another disabled vessel swam into mid-channel, where they were hoisted aboard outward-bound destroyers. Proof that getting back into the battle took precedence over their own lives was the fact that the comparative safety of the shore lay only a few yards away. Lying in a hospital bed when the first air raid alarm sounded, one officer leaped up, brushed aside nurses and ran across the Navy Yard to his ship. He fought with such gallantry and zeal, despite his illness, that his captain recommended him for promotion.

"There was the case of the destroyer tender, which lay alongside a dock undergoing major overhaul, powerless and without armament. Unable to assume an active defence role, she concerned herself with the vital task of rescue with her available ship's boats. One Naval Reserve ensign volunteered as skipper of a motor launch. With four men he proceeded across Pearl Harbour's reverberating channel through a hail of enemy machine-gun fire and shrapnel. They saved almost 100 men from one battleship—men who had been injured or blown overboard into the oil-fired waters. The attack on this vessel was at its height as these rescue operations proceeded. Suddenly the launch's propeller jammed. Coolly, the ensign directed the work of disengaging the screw as flames licked around its wooden hull, meantime also supervising the picking up of more victims from the harbour. His captain cited him for 'initiative, resourcefulness, devotion to duty and personal bravery displayed.'

"Four motor-torpedo boats had been loaded aboard a fleet tanker for shipment. Their youthful ensign-captains put their power-driven turret machine guns into immediate action, accounting for at least one enemy raider plane.

"To the unsung heroes of the harbour auxiliaries must go much of the credit for helping to stem the onslaught. Even the lowly garbage lighters shared the grim task. One came alongside a blazing ship which threatened momentarily to explode. Calmly the yardcraft's commander led fire-fighting both aboard the warship and on the surface of the harbour. He kept his tiny vessel beside the larger one for 24 hours.

"Men's will-to-fight was tremendous. One seaman had been confined to his battleship's brig for misconduct a few days earlier. When an explosion tore open the door, he dashed straight to his battle station on an anti-aircraft gun. On the submarine base dock a bluejacket, carrying a heavy machine gun for which there was no mount immediately available, shot the weapon from his arms, staggering under the concussion of the rapid fire.

"Quick thinking in the dire emergency probably saved many lives—and ships. An aviation machinist's mate aboard one ship saw that flames from the huge vessel threatened a repair ship alongside. He ran through the blaze and single-handedly slashed the lines holding the two ships together. Freed, the smaller craft drew clear. Only in the final moments, when remaining aboard appeared utterly hopeless, would men leave their ships. Then they went reluctantly. Once ashore, instead of finding some dry place to recuperate from their terrific pounding, they pitched emergency quarters as near their vessels as possible. And with

portable guns they continued to fight ; later they stood guard at these same camps as repair operations began on their ships, setting regular ship-board watches. Like all treacherous attacks, the bombing of Pearl Harbour by the Japanese caught certain vessels of the fleet under periodic overhaul. While in this condition of repair, such ships were not able to utilise their offensive powers to the greatest effectiveness. These ships, therefore, turned to with a will at many useful purposes. One ship rescued with its boats hundreds of survivors thrown into the water by the force of explosions ; meanwhile the surface of the water was becoming a raging inferno from burning oil. Other ships sent their repair parties to help the fighting ships to keep afloat. Others sent ammunition parties to maintain the flow of powder and shells to the guns. Without doubt the whole spectacle was the greatest spontaneous exhibition of co-operation, determination and courage that the American Navy has been called upon to make. The crew of one ship followed it around on its outside as it capsized, firing their guns until they were under water. Those same men stood on the dock and cheered as one of the more fortunate ships cleared harbour and passed by, en route after the Japanese. Of all the accounts submitted on that memorable day, the record shows a continual demonstration of courage, bravery and fearlessness of which the American nation may well be proud."

THE COMMISSION OF ENQUIRY.

After receiving Colonel Knox's report, President Roosevelt appointed the following Commission to ascertain the full facts of the whole episode :

Judge Owen J. Roberts, Associate Justice of the United States Supreme Court, a former Attorney-General of the United States, Chairman.

Major-General Frank R. McCoy, a former commander of the Army's Philippine Department.

Brigadier-General Joseph T. McNarney, an Army Air Corps commander.

Admiral William H. Standley, retired, a former Chief of Naval Operations.

Admiral Joseph M. Reeves, retired, a former commander of the Fleet.

On January 28 the commission made the following report to the President, which was printed in the American press of January 26. The report was in two parts, the first part being findings of fact, and the second part containing the commissioners' conclusions.

After recapitulating that their terms of reference, reporting their movements, the principles upon which they conducted their enquiry and the number of meetings they held, the report then continued as follows:

I. FINDINGS OF FACT.

About 7.55 a.m. Honolulu time (1.25 p.m., E. S. T.), on Sunday, December 7, 1941, Japanese forces attacked Army and Navy installations and ships of the Pacific Fleet in Oahu, Territory of Hawaii.

Although the United States and Japan were at peace on that morning, Japan planned to announce to the Secretary of State of the United States at 1 p.m. that day E. S. T. (7.30 a.m. Honolulu time) the severance of diplomatic relations and simultaneously to attack the island of Oahu and Pearl Harbour. The military preparations for this breach of international faith and honour were put in train and the forces for its consummation

had been dispatched weeks prior to any initiation of the planned severance of relations.

II. HAWAIIAN ISLAND AREA.

The territory of Hawaii comprises the group of islands known as "The Hawaiian Islands." This group consists of the larger islands—Hawaii, Maui, Molokai, Oahu, and Kauai—and a number of smaller islands. They extend from Hawaii in the south some 300 miles in a northwesterly direction, including Kauai in the north. For purposes of certain developments and protection, the islands of Midway, Wake, Johnston, Palmyra, Christmas and Canton had been placed under the responsible naval and military heads in the Hawaiian area.

The importance of the Territory of Hawaii from a national defence standpoint is the fact that Pearl Harbour, the main outlying naval base in the Pacific, is located in the Island of Oahu, one of the Hawaiian group. For this reason all measures for the protection and defence of the Territory have centered in and around Oahu, the other islands being garrisoned by minor forces only. A main outlying naval base, such as Pearl Harbour, is intended for the use of the fleet for taking on fuel and supplies, for recreation and rest of the fleet personnel and for the repair and refitting of ships.

III. CONFLICTING POLICIES.

It has been well known that the policy of the United States as to affairs in the Pacific was in conflict with the policies of other governments. It was realized by the State, War and Navy Departments of the United States that unless these policies were reconciled war in the Pacific was inevitable.

IV. ARMY-NAVY RESPONSIBILITY.

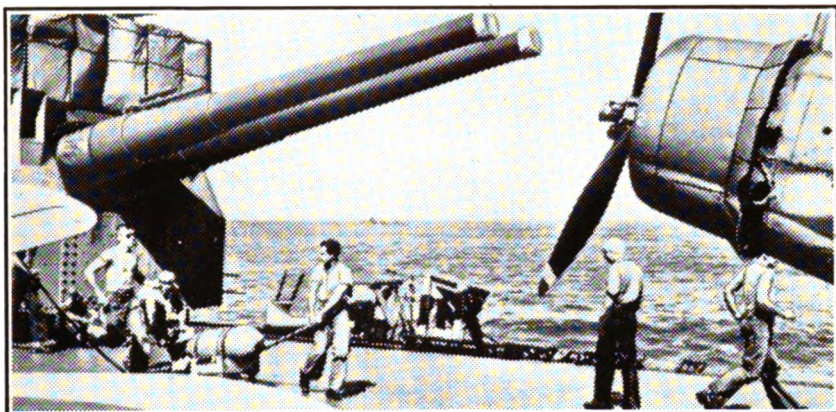
Plans and preparations against the contingency of war are the joint responsibility of the military and naval authorities, and within the limits of funds and authorizations provided by the Congress were being ceaselessly carried out.

Under these plans the general function of the Army is to conduct military operations in direct defence of United States territory. The general function of the Navy is to conduct naval operations to gain and maintain control of vital sea areas, thereby contributing to the defence of the coastal frontiers.

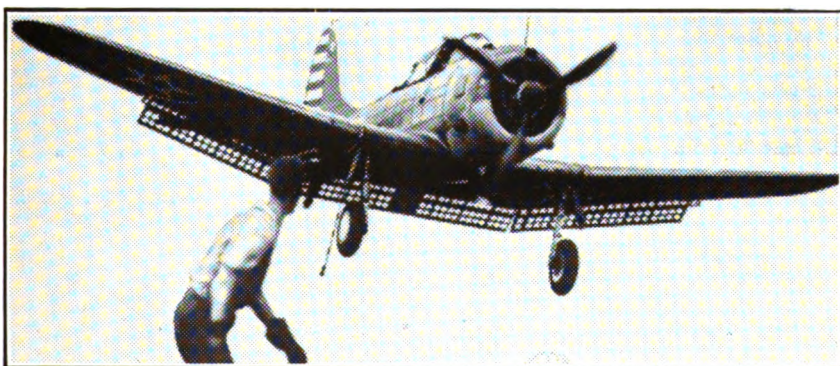
Specific plans for the protection of the Hawaiian area against every contingency had been prepared. These included joint Army and Navy war plans and War Department and Navy Department plans subsidiary thereto which establish the Hawaiian coastal frontier, assign tasks and forces to both Army and Navy for its joint defence, and prescribe that the system of co-ordination between the responsible Army and Navy Commanders shall be by mutual co-operation.

V. RESPONSIBILITY FIXED.

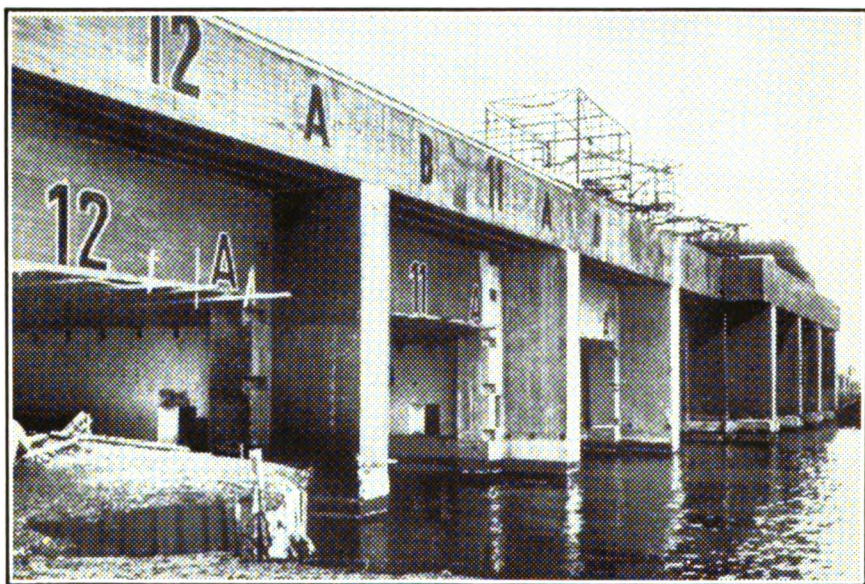
The responsibility for the joint defence of the Hawaiian coastal frontier rested upon the Commanding General, Hawaiian Department, and the Commandant Fourteenth Naval District, the latter acting as a subordinate of the Commander-in-Chief of the Pacific Fleet. The Commander-in-Chief of the fleet, in addition, was assigned the task of protecting the territory within the Hawaiian naval coastal frontier by destroying hostile



In a United States aircraft carrier. 1. Loading up a bomber.



In a United States aircraft carrier. 2. A Fleet fighter landing on.



Concrete submarine shelters built by Germans in an Atlantic port.

expeditions and by supporting land and air forces in denying the enemy the use of land positions within that frontier, and the further task of covering the operations of the Hawaiian coastal frontier forces. The Commanding General, Hawaiian Department, could properly deal respecting defence measures and dispositions with either the Commander-in-Chief of the Pacific Fleet or the Commandant of the Fourteenth Naval District.

The Commander-in-Chief of the Pacific Fleet from February 1, 1941, to December 17, 1941, was Admiral Husband E. Kimmel. The Commandant, Fourteenth Naval District, from April 11, 1940, to date is Rear-Admiral Claude C. Bloch. The Commanding General Hawaiian Department, February 7, 1941, to December 17, 1941, was Lieut.-Gen. Walter C. Short.

A joint defence plan entitled "Joint Coastal Frontier Defence Plan, Hawaiian Coastal Frontier," was prepared by General Short and Rear-Admiral Bloch, the latter acting under the direction of Admiral Kimmel. Each commander adopted a standing operating procedure, or standing orders, to carry out his obligation under the joint agreement. This Joint Coastal Frontier Defence Plan was intended to become operative upon order of the War and Navy Departments or as agreed upon by the local commanders in the case of an emergency, a threat of hostile action, or the occurrence of war.

VI. MEANS FOR DEFENCE.

The means available to the Army, for the fulfilment of its mission, consist of coast defence and anti-aircraft artillery, mobile ground forces, the Hawaiian Air Force, and an aircraft warning service. The supporting elements of the Navy consist of local naval defence forces comprising light surface craft and shore-based aircraft not assigned to the fleet.

The fleet, as such, was not charged with the defence of Pearl Harbour, except that certain aircraft attached to the fleet, when present, and the anti-aircraft weapons of such units of the fleet as were in port, were available.

It was recognized that, prior to furnishing the full war-strength garrison, insufficient forces were available to maintain all the defences on a war footing for extended periods of time. The responsible commanders made numerous recommendations to the War and Navy Departments for additional forces, equipment and funds which they deemed necessary to insure the defence of the Hawaiian coastal frontier under any eventuality.

The national situation permitted only a partial filling of these requirements. However, presupposing timely dispositions by the Army and Navy commands in Hawaii, the forces available to them were adequate to frustrate a surprise air attack or greatly to mitigate its effectiveness.

VII. SPEEDY ACTION URGED.

In a letter of January 24, 1941, the Secretary of the Navy advised the Secretary of War that the increased gravity of the Japanese situation had prompted a restudy of the problem of the security of the Pacific Fleet while in Pearl Harbour.

The writer stated "If war eventuates with Japan, it is believed easily possible that hostilities would be initiated by a surprise attack upon the fleet or the naval base at Pearl Harbour."

The writer stated that the "inherent possibilities of a major disaster" warranted further speedy action to "increase the joint readiness of the Army and Navy to withstand a raid of the character mentioned. . . ."

The letter proceeded :

"The dangers envisaged in their order of importance and probability are considered to be: (1) air-bombing attack, (2) air-torpedo plane attack, (3) sabotage, (4) submarine attack, (5) mining, (6) bombardment by gunfire."

It stated the defence against all but the first two were then satisfactory, described the probable character of an air attack and urged consideration by the Army of dispositions to discover and meet such attack and provision of additional equipment therefor.

It concluded with recommendations for the revision of joint defence plans with special emphasis on the co-ordination of Army and Navy operations against surprise aircraft raids. It also urged the conduct of joint exercises to train the forces to meet such raids.

The Secretary of War replied on February 7, 1941, giving the present and prospective status of the Hawaiian Department in respect of aeroplanes and anti-aircraft artillery and stating with respect to the other proposals of the Secretary of the Navy that a copy of the letter was being forwarded to the Commanding General, Hawaiian Department, with direction to him to co-operate with the local naval authorities in making the suggested measures effective.

Admiral Kimmel and General Short received copies of these letters at about the same time they assumed the commands which they held on December 7, 1941. Rear-Admiral Bloch also received copies.

The Joint Coastal Frontier Defence Plan, and plans subsidiary thereto, envisaged the possibility of an air attack and estimated that, if made, it would most likely occur at dawn. An agreement between the Hawaiian Air Force and commander, Navy Patrol Wing 2, established the responsibilities for the joint use and operation of the available air forces of the Army and Navy. The Standing Operating Procedure Hawaiian Department, and standing orders of the United States Pacific Fleet and the Fourteenth Naval District also prescribed measures for protection against air attack. Frequent joint drills and exercises were conducted during the year 1941 to insure such measures would be effective.

VIII. SECRETARIES IN CONTACT.

For months prior to December 7, 1941, the Secretary of State was repeatedly in contact with the Secretary of War and the Secretary of the Navy, not only in Cabinet meetings but in meetings of the War Council; and on the occasions of those contacts and in conference with the Secretary of War and the Secretary of the Navy, discussed negotiations with Japan and the growing tensivity of the relations of the United States with Japan. At meetings of the War Council the Chief of Staff and the Chief of Naval Operations were also present.

The Secretary of State constantly kept the Secretary of War and the Secretary of the Navy informed of the progress of the negotiations, and all three of these officials were cognizant of the growing threat of hostilities and of the military and naval needs and measures consequent thereupon.

The Secretaries of War and Navy were in constant touch with the Chief of Staff and the Chief of Naval Operations, and imparted to them

the information received from the Secretary of State and the results of their conferences with him. The latter officers in turn advised the responsible commanders in the field of the progress of events and of the growing threat of hostilities.

The responsible commanders in the Hawaiian area were aware that previous Japanese actions and demonstrated Axis methods indicated that hostile action might be expected prior to a declaration of war.

IX. WARNED OF WAR THREAT.

October 16, 1941, the Commanding General, Hawaiian Department, and the Commander-in-Chief of the fleet were advised by the War and Navy Departments of the changes in the Japanese Cabinet, of the probability of hostilities between Japan and Russia and of the possibility of an attack by Japan on Great Britain and the United States.

Both commanders were warned to take precautions and to make preparatory dispositions which would not disclose their strategic intentions or constitute provocation as against Japan. Admiral Kimmel made certain dispositions of units of the fleet and placed additional security measures in effect in the operating areas outside Pearl Harbour.

At that time various task-forces of the Navy were engaged in training operations and manœuvres which were deemed highly important to the training of the fleet personnel, and the Army was also conducting intensive training, particularly of its air arm. The responsible commanders testified that to undertake increased defence measures respecting Pearl Harbour and the Hawaiian area would necessitate curtailment of training, if not its virtual suspension, and they thought the situation was not such as to require this.

November 24, 1941, the Chief of Naval Operations sent a message to Admiral Kimmel in which he stated that in the opinion of the Navy Department a surprise aggressive movement in any direction by the Japanese, including an attack on the Philippines, or Guam, was a possibility. That the doubt as to favourable outcome of pending negotiations, the statements of the Japanese Government, and the movements of its army and naval forces, supported this opinion. The communication enjoined secrecy to prevent complication of the tense existing situation.

The message advised that the Chief of Staff of the Army required that the local senior Army officers be advised that he concurred in the dispatch. This message was seen by both the Commander-in-Chief of the fleet and the Commanding General of the Hawaiian Department.

The responsible commanders in Hawaii knew that negotiations had been continued through October and November, and were awaiting further developments. November 27, 1941, the Chief of Staff of the Army informed the Commanding General, Hawaiian Department, that the negotiations with Japan seemed to be ended, with little likelihood of their resumption; that Japanese action was unpredictable; that hostilities on the part of Japan were momentarily possible; that in the event hostilities could not be avoided the United States desired that this Nation should not commit the first overt act; the Department Commander was not to be restricted to any course which would jeopardize his defence.

ORDERS FOR PREPARATION.

The message directed him, even prior to hostile action, to undertake such reconnaissance and other measures as he deemed necessary, but to

carry them out in such a way as not to alarm the civil population or disclose his intent. He was directed to restrict the information contained in the message to the minimum of essential officers and to report to the Chief of Staff the measures taken. The purport of this message was communicated by the Department Commander to the Commander-in-Chief of the Pacific Fleet.

On the same day (November 27, 1941) the Chief of Military Intelligence sent a message to the Intelligence Officer on the Staff of the Commanding General, Hawaiian Department, directing him to inform the Commanding General and his Chief of Staff that negotiations with Japan had practically ceased ; that hostilities might ensue, and that subversive activities might be expected.

On the same day (November 27, 1941) the Chief of Naval Operations sent a message to the Commander-in-Chief of the Pacific Fleet, which stated in substance that the dispatch was to be considered a war warning ; that the negotiations with Japan in an effort to stabilize conditions in the Pacific had ended ; that Japan was expected to make an aggressive move within the next few days ; than an amphibious expedition against either the Philippines, Thai or Kra Peninsula, or possibly Borneo, was indicated by the number and equipment of Japanese troops and the organization of their Navy task-forces.

It directed the execution of a defensive deployment in preparation for carrying out war tasks. It stated that Guam, Samoa, and Continental Districts had been directed to take appropriate measures against sabotage and that a similar warning was being sent by the War Department. It ordered the addressee to inform naval districts and Army authorities. The Commander-in-Chief of the fleet communicated the purport of this message to the general commanding the Hawaiian Department of the Army.

At the time of our hearing General Short had no independent recollection of the last-mentioned message, although he felt that it must have been shown to him.

November 27, 1941, the Commanding General, Hawaiian Department, in response to the direction of the Chief of Staff that he report measures taken, informed the Chief of Staff that he had alerted his command against sabotage and that he was maintaining liaison with the Navy. No reply referring to this message was sent by the War Department ; but General Short testified that he considered the Adjutant-General's message referred to in the next succeeding paragraph a reply.

November 28, 1941, the Commanding General, Hawaiian Department, received from the Adjutant-General of the Army a message stating that the critical situation required every precaution to be taken at once against subversive activities, within the scope of the Army's responsibilities ; that all necessary measures be taken to protect military establishments, property, and equipment against sabotage, against propaganda affecting Army personnel, and against all espionage.

The message disclaimed ordering any illegal measures, and warned that protective measures should be confined to those essential to security, so as to avoid unnecessary publicity and alarm. The message stated that identic communications were being sent to all air stations, and on November 28 the Chief of the Army Air Forces sent such an identic message to the Commanding General, Hawaiian Air Force.

REPORT ON MEASURES TAKEN.

November 29, 1941, the Commanding General, Hawaiian Department, replied to the last-mentioned message, outlining at length and in detail the measures taken to prevent sabotage of military establishments and property and essential industrial and public utility installations. No reply was sent by the War Department to this message. General Short testified that he considered this series of messages a tacit agreement that the measures taken were all that were intended by the department.

November 29, 1941, the Chief of Naval Operations sent a message to the Commander-in-Chief of the fleet, which was in substance a quotation of the Chief of Staff's dispatch of November 27 to the Commanding General, Hawaiian Department; and in addition directed the addressee to take no offensive action until Japan had committed an overt act, and ordered certain action in case hostilities should occur.

November 30, 1941, the Chief of Naval Operations sent a dispatch to the Commander-in-Chief of the Asiatic Fleet, and also forwarded the message to the Commander-in-Chief of the Pacific Fleet for his information, in which it was stated the indications were that Japan was about to launch an attack on the Kra Isthmus, directing the Commander-in-Chief to do certain scouting, but to avoid the appearance of attacking. Admiral Kimmel testified that he had viewed this message as indicating that the Navy Department was not expecting a Japanese attack on Hawaii.

The Navy Department sent three messages to the Commander-in-Chief of the Pacific Fleet. The first of December 3 1941, stated that it was believed certain Japanese consulates were destroying their codes and burning secret documents; the second of December 4, 1941, instructed the addressee to destroy confidential documents and means of confidential communication, retaining only such as were necessary, the latter to be destroyed in event of emergency (this was sent to the Commander-in-Chief of the Pacific Fleet for information only); and the third of December 6, 1941, directing that in view of the tense situation the naval commands on the outlying Pacific islands might be authorized to destroy confidential papers then or later, under conditions of greater emergency, and that those essential to continued operations should be retained until the last moment.

The foregoing messages did not create in the minds of the responsible officers in the Hawaiian area apprehension as to probable imminence of air raids. On the contrary, they only served to emphasize in their minds the danger from sabotage and surprise submarine attack. The necessity for taking a state-of-war readiness which would have been required to avert or meet an air-raid attack was not considered.

X. JAPAN'S MOVEMENTS DISCLOSED.

December 1, 1941, the Director of Naval Intelligence issued a bulletin which, under the caption "Japanese Naval Situation," stated:

"Deployment of naval forces to the southward has indicated clearly that extensive preparations are under way for hostilities. At the same time troop transports and freighters are pouring continually down from Japan and Northern China coast ports headed south, apparently for French Indo-China and Formosan ports.

"Present movements to the south appear to be carried out by small individual units, but the organization of an extensive task-force, now

definitely indicated, will probably take sharper form in the next few days' To date this task-force, under the command of the Commander-in-Chief' Second Fleet, appears to be sub-divided into two major task groups, one gradually concentrating off the Southeast Asiatic Coast, the other in the mandates.

"Each constitutes a strong striking force of heavy and light cruisers, units of the combined Air Force, destroyer and submarine squadrons. Although one division of battleships also may be assigned, the major capital ship strength remains in home waters, as well as the greatest portion of the carriers."

The Naval Intelligence Service in Hawaii, due to lack of information indicating that the bulk of Japanese carriers were at sea, concluded that they were in home ports.

XI. WARNING OF ATTACK.

At about noon E. S. T. (6.30 a.m., Honolulu time), December 7, an additional warning message indicating an almost immediate break in relations between the United States and Japan was despatched by the Chief of Staff after conference with the Chief of Naval Operations, for the information of responsible Army and Navy commanders.

Every effort was made to have the message reach Hawaii in the briefest possible time, but due to conditions beyond the control of anyone concerned the delivery of this urgent message was delayed until after the attack.

XII. AIR ATTACK DOUBTED.

The Commanding General, Hawaiian Department, the Commander-in-Chief of the fleet and the Commandant Fourteenth Naval District, their senior subordinates, and their principal staff officers, considered the possibility of air raids.

Without exception, they believed that the chances of such a raid while the Pacific Fleet was based upon Pearl Harbour were practically nil. The attack of Sunday, December 7, 1941, was therefore a complete surprise to each of them.

While General Short and Admiral Kimmel conferred frequently with respect to joint Army-Navy plans and procedure, they did not, on or subsequent to November 27, 1941, hold any conference specifically directed to the meaning of the messages received from the War and Navy Departments or concerning action required to be taken pursuant to those messages.

For some time prior to November 27, 1941, the War Department and the Navy Department had under consideration the possibility of sending Army aeroplanes to Wake and Midway and withdrawing Marine planes then on those islands; of relieving Marines stationed there by the substitution of units of the Army. General Short, Admiral Kimmel and Rear-Admiral Bloch had been in conference concerning this proposal.

At the time of the receipt of the messages of November 27 by Admiral Kimmel and General Short, respectively, this proposal was a subject of discussion. General Short held discussions with Admiral Kimmel on November 27, December 1, 2, and 3 concerning this matter in an effort to compose certain differences of view.

At one of these conferences Admiral Kimmel inquired of his war planes officer, Captain McMorris, who was present, concerning the probability of a surprise air attack on Oahu. According to General Short, Captain

McMorris replied there was no probability of such an attack ; and, according to Captain McMorris, his reply was that the Japanese would never so attack. According to the testimony, Admiral Kimmel and General Short did not discuss means or measures for Hawaiian defence to be adopted in the light of the messages.

INDEPENDENT ACTION TAKEN.

On and after November 27, 1941, the Commanding General, Hawaiian Department, and the Commander-in-Chief of the Pacific Fleet, independently took such action as each deemed appropriate to the existing situation. Neither informed the other specifically of the action he was taking, and neither inquired of the other whether or not any action had been taken, nor did they consult as to the appropriateness of the actions taken by them respectively.

After receipt of the message of November 27 the following action was taken :

The Commanding General, Hawaiian Department, ordered Alert No. 1 (see below) into effect on November 27, and it was maintained in effect until December 7. At the same time he ordered that the aircraft warning system operate daily from 4 a.m. to 7 a.m. The Commandant of the Fourteenth Naval District, in his capacity as base defence officer, called a conference of all the destroyer commanders of the inshore patrol, advised them that something might happen, and that they should be on the alert.

The Commander-in-Chief of the Fleet made certain dispositions of units of the fleet for the purpose of strengthening his outposts to the south and west of the Hawaiian Islands, and also issued an order that any Japanese submarines found in the operating areas around the Island of Oahu should be attacked. This order went beyond the authority given him by the Navy Department.

In the Hawaiian Department's standing operating procedure governing the defence of the Hawaiian Coastal Frontier, three states of readiness were prescribed, known as Alert No. 1, Alert No. 2 and Alert No. 3. Alert No. 1 was thus defined :

" This alert is a defence against acts of sabotage and uprisings within the islands, with no threat from without."

Alert No. 2 was thus defined :

" This alert is applicable to a condition more serious than Alert No. 1. Security against attacks from hostile subsurface, surface and aircraft, in addition to defence against acts of sabotage and uprisings, is provided."

Alert No. 3 was thus defined :

" This alert requires occupation of all field positions by all units, prepared for maximum defence of Oahu and the Army installations on outlying islands."

XIII. RESPONSIBILITIES OF ARMY.

The responsibilities of the Army included the installation and operation of an aircraft warning system for the detection of water-borne and air-borne craft at a distance from the coast. Throughout the late spring and summer of 1941 the Army was engaged in the installation of permanent facilities for this purpose on the Hawaiian Islands. Permanent installations had not, on December 7, 1941, been completed.

By November 27, 1941, certain mobile equipment had been installed at temporary locations, and was being operated intermittently throughout the day for the purpose of training personnel in its operation. On November 27, 1941, in connection with the order for Alert No. 1, the Commanding General, Hawaiian Department, ordered that this system be operated each day during the period from 4 a.m. until 7 a.m. It was intended that in the near future the Navy should have officer personnel in the information centre, but up to December 7 such officers had not been designated.

In accordance with the order in effect, the system closed at 7 a.m., Sunday, December 7. A non-commissioned officer who had been receiving training requested that he be allowed to remain at one of the stations, and was granted leave so to do. At about 7.02 a.m., he discovered what he thought was a large flight of 'planes slightly east of north of Oahu, at a distance of about 180 miles. He reported this fact at 7.20 a.m. to a lieutenant of the Army who was at the central information desk, having been detailed there to familiarise himself with the operation of the system.

This inexperienced lieutenant, having information that certain United States 'planes might be in the vicinity at the time, assumed that the 'planes in question were friendly 'planes, and took no action with respect to them. The recording of the observation made indicated that these aeroplanes were tracked toward the island then lost.

On November 27, 1941, there was sufficient partially trained personnel available to operate the aircraft warning system throughout 24 hours of the day, as installed in its temporary locations. An arc of nearly 360 degrees around Oahu could have been covered.

Admiral Kimmel, on and prior to December 7, 1941, assumed that the aircraft warning system was being fully operated by the Army, but made no inquiry after reading any of the messages of October and November from the War and Navy Departments as to what the fact was with respect to its operation.

XIV. NO SUNDAY PATROL.

The Joint Coastal Frontier Defence Plan provided that, when it became effective, the Army should conduct an inshore aeroplane patrol, covering the circumference of the Island of Oahu to a distance of about 20 miles. Prior to December 7, 1941, no inshore patrol was conducted, except during drills and manœuvres. Pilots were being trained on week days, and the training involved flying around the confines of Oahu from about 8 o'clock in the morning through the day. On Sunday morning no inshore aeroplane patrol was conducted.

XV. PLAN NOT IN OPERATION.

Under the joint Coastal Frontier Defence Plan, when the plan became effective the Navy was to conduct distant air reconnaissance, radiating from Oahu to a distance of from 700 to 800 miles. Prior to December 7, 1941, no distant reconnaissances were conducted, except during drills and manœuvres.

The fleet from time to time had task-forces operating in various areas off the Island of Oahu, and in connection with such operations carrier and patrol 'planes conducted reconnaissances of the operating areas. The sectors searched, however, constituted but small areas of the total arc of 360 degrees, and rarely extended to a radius of 700 miles.

Means were available for distant reconnaissance which would have afforded a measure of security against a surprise air attack.

General Short assumed that the Navy was conducting distant reconnaissance, but after seeing the warning messages of October and November from the War and Navy Departments he made no inquiry with respect to the distant reconnaissance, if any, being conducted by the Navy.

XVI. SPIES ON ISLAND OF OAHU.

There were, prior to December 7, 1941, Japanese spies on the Island of Oahu. Some were Japanese consular agents and others were persons having no open relations with the Japanese Foreign Service. These spies collected, and through various channels transmitted, information to the Japanese Empire respecting the military and naval establishments and dispositions on the island.

In Hawaii the local Army intelligence service has always devoted itself to matters pertaining to Army personnel and property and the local naval intelligence service to matters pertaining to Navy personnel and property. In addition, prior to the establishment of an office of the Federal Bureau of Investigation in Hawaii, naval intelligence investigated enemy activities amongst the civil population.

When the bureau's office was established it was agreed by the three governmental agencies that the bureau should take over and become primarily responsible for investigation of matters connected with the civil population, and that the three services should co-operate with each other. Efforts were made by the bureau to uncover espionage activities in Hawaii.

The United States being at peace with Japan, restrictions imposed prevented resort to certain methods of obtaining the content of messages transmitted by telephone or radio over the commercial lines operating between Oahu and Japan. The bureau and the local intelligence staffs were unable, prior to December 7, to obtain and make available significant information respecting Japanese planes and fleet movements in the direction of Hawaii.

In the summer of 1941 there were more than 200 consular agents acting under the Japanese consul who was stationed in Honolulu, territory of Hawaii. The naval district intelligence office raised a question with the Federal Bureau of Investigation and with the intelligence officer of the Hawaiian Department of the Army whether these agents should not be arrested for failing to register as agents of a foreign principal as required by statutes of the United States.

NO ACTION AGAINST AGENTS.

In conferences respecting this question, the Commanding General, Hawaiian Department, objected to the arrest of any such persons at least until they had been given notice and an opportunity to register, asserting that their arrest would tend to thwart the efforts which the Army had made to create friendly sentiment toward the United States on the part of Japanese aliens resident in Hawaii and American citizens of Japanese descent resident in Hawaii and create unnecessary bad feeling. No action was taken against the agents.

It was believed that the centre of Japanese espionage in Hawaii was the Japanese Consulate at Honolulu. It has been discovered that the Japanese Consul sent to and received from Tokyo in his own and other

names many messages on commercial radio circuits. This activity greatly increased toward December 7, 1941.

The contents of these messages, if it could have been learned, might have furnished valuable information. In view of the peaceful relations with Japan and the consequent restrictions on the activities of the investigating agencies they were unable prior to December 7 to obtain and examine messages transmitted through commercial channels by the Japanese Consul, or by persons acting for him.

It is now apparent that through their intelligence service the Japanese had complete information. They evidently knew that no task-force of the United States was anywhere in the sector northeast, north, and northwest of the Hawaiian Islands. They evidently knew that up to December 6 no 'plane reconnaissance was maintained in any sector. They evidently knew that up to December 6 no inshore aeroplane patrol was being maintained around the periphery of Oahu.

They knew from maps which they had obtained the exact location of vital air-fields, hangars, and other structures. They also knew accurately where certain important naval vessels would be berthed. Their fliers had the most detailed maps, courses, and bearings, so that each could attack a given vessel or field. Each seems to have been given a specified mission.

XVII. SOME PRECAUTIONS TAKEN.

The passes and liberty granted the personnel of the Army and Navy in Hawaii on Saturday, December 6, were normal for a period when the forces were not upon a war footing, with the following exceptions: The normal Army guard had been increased by approximately 100 per cent; two battalions of infantry were held in reserve for anti-sabotage defence; anti-aircraft gun crews were maintained on ships in harbour for instant defence; all Navy personnel, with the exception of those authorized to be absent were required to be in their quarters at midnight; all places of amusement in Honolulu and all entertainments at the Army posts were closed at midnight; all saloons and drinking places in Honolulu were closed at midnight.

On the night of December 6 numerous officers of the Army and Navy attended social functions at various points on the island of Oahu, principally the usual Saturday functions at the various posts and naval establishments. The Commanding General, Hawaiian Department, and the Commander in-Chief of the Pacific Fleet, were both guests at dinners away from their posts of command on that evening, but returned to their quarters at an early hour.

The percentage of strength in the Army present for duty on the island of Oahu at 8.00 a.m., December 7, 1941, reported by all major echelons and posts, were: Twenty-fourth Infantry Division, 90 per cent; Twenty-fifth Infantry Division, 85.6 per cent.; Coast Artillery Corps, 87.5 per cent.; Air Force, 88.9 per cent.; miscellaneous, including Department Headquarters, Ordnance, Quartermaster and Medical, 92 per cent. Estimated general percentage 88.8 per cent.

Reports from large ships and destroyers that were in Pearl Harbour during the attack show 60 per cent. of officers on board, and 96 per cent. of the men. Of seventy-five vessels of the fleet, of all kinds, 49 commanding officers were aboard during the attack, and 22 were en route to their ships, one was on another ship, and one was on authorized leave, which leaves two for whom we are unable to account.

NO EXCESSIVE DRINKING SEEN.

Intoxicating liquor is sold on the island of Oahu, and men on pass or on liberty have the opportunity to buy and consume it. Following the established procedure, at home and abroad, the Army exercises disciplinary control of men on pass through its military police, and the Navy of men on liberty by the use of shore patrols.

These organizations take into custody any person showing evidence of intoxication. On the night of December 6-7, 1941, from 6 p.m. to 6 a.m., arrests of soldiers by the military police for intoxication, were 38, and arrests of sailors by the Navy shore patrol, for intoxication, were four.

By comparison the arrests of civilians for drunkenness on that night were 39. Thorough inquiry disclosed there is no evidence of excessive drinking by any officer of either service on that night.

The evidence shows that as respects the use of intoxicating liquor and intoxication, the conditions amongst the men of the Army and of the Navy on the night of December 6 compare closely with similar conditions for the several preceding months.

On Saturday, December 6, 1941, the usual percentage of enlisted strength entitled to passes or liberty took advantage of such privilege to spend the afternoon or evening in the city of Honolulu.

Application of this ratio to total numbers of all services then on the island of Oahu and in Pearl Harbour, amounting to about 75,000 men, indicates that no less than 11,000 soldiers, sailors and Marines visited Honolulu that afternoon and evening.

In normal time more enlisted men of both services are absent from duty by permission on Saturday nights than on other nights and on Saturday nights more officers are customarily absent than on week-day nights.

On the morning of Sunday, December 7, Army posts and naval vessels and stations were adequately manned, for the readiness and alert then in effect, by men fit for duty.

XVIII. COMBINED RAID AND ATTACK.

The attack of the morning of December, 7, 1941, was a combined air raid and submarine attack on the Island of Oahu, a bombardment of Midway, and a continuous air attack and bombardment on Wake Island.

Available information indicates that the force attacking Oahu consisted of either three or four Japanese carriers, with supporting surface craft and a few small submarines, and that this force had maintained radio silence during its approach, which, except for the submarines, was from the northward of Oahu.

In the attack on Oahu a suspicious object was sighted in the prohibited area off Pearl Harbour at 6.30 a.m., by the U.S.S. Antares. Between 6.33 and 6.45, this object, which was a small submarine, was attacked and sunk by the concerted action of a naval patrol plane and the U.S.S. Ward.

A report of this action by the Ward reached the naval base watch officer at 7.12 a.m., who notified his chief of staff. The ready destroyer was dispatched to investigate, but no alert warnings were issued, based upon this report.

Another small submarine was fired upon, depth-charged, rammed and sunk inside the harbour between 8.35 and 8.43 a.m. A third small submarine grounded in Kaneohe Bay and was captured. There is no evidence of any damage by torpedoes fired by these submarines.

Pearl Harbour was provided with an anti-torpedo net which would have prevented the entrance of torpedoes into the harbour and would have revealed the entrance of a submarine. The procedure prior to December 7, 1941, was to keep the net closed during the hours of darkness, opening it only when necessary for a vessel to pass through.

FIRST SIGHT OF SUBMARINE.

It was kept open during daylight hours, on the theory that, during daylight, the channel entrance destroyer, the net vessel and other vessels in the vicinity, would detect a submerged or partially submerged submarine. December 7 the net was opened at 4.58 a.m. for the entrance of two minesweepers.

It was kept open until 8.40 a.m., when it was closed by orders. The net was not damaged. The submarine was first sighted in the harbour at 7.45 a.m. The time of its entrance is not known, but probably it passed in about 7 a.m.

An estimated force of from 150 to 200 fighting, bombing and torpedo 'planes simultaneously attacked Pearl Harbour and all air bases on Oahu at about 7.55 a.m. All attacking 'planes had withdrawn before 11 a.m. As a result of the attack serious loss of life was caused and serious damage was inflicted on ships in the harbour, and 'planes, hangars, and other facilities at Hickam Field, Ewa Field, Ford Island, Wheeler Field, Bellows Field and Kanehe.

The major part of the damage to ships in Pearl Harbour resulted from torpedoes launched from 'planes. The torpedoes were of an obsolete type, altered to increase their explosive load, to decrease their radius and fitted with side vanes to insure functioning in shallow water, a weapon peculiarly adapted to an attack such as the one delivered upon ships in Pearl Harbour. Many of the bombs had extra-heavy cases and appeared to be modified armour-piercing shells.

December 7, 1941, at 9.30 p.m. Midway time (11.30 p.m. Honolulu time) a force believed to consist of two cruisers and two destroyers, approaching from the southward, opened fire and shelled Midway Island for about 80 minutes. About noon December 8, 1941 (2.50 p.m., December 7, Honolulu time), some 27 land 'planes made a strafing and bombing attack on Wake Island. Some loss of life and damage to material resulted on each island. Attacks on Wake continued until its capture on December 22, 1941 (December 21, Honolulu time.)

ALERT PROMPTLY EXECUTED.

Immediately upon realizing that the Japanese were attacking, the Commanding General, Hawaiian Department, ordered Alert Number 3. The alert was executed with reasonable promptness. At the same time the Commander-in-Chief placed the fleet on a full war basis and issued a series of orders in an effort to intercept and destroy the attacking force.

Officers and enlisted men, in defending against the attack, demonstrated excellent training and high morale. Anti-aircraft weapons aboard ship, which were not already manned, and anti-aircraft weapons ashore, which were in position, were promptly manned. Junior officers and enlisted men on their own initiative procured from storage every possible automatic weapon. These weapons continued in action during and in spite of low

level strafing and dive bombing which have been known to demoralize even seasoned troops.

At least three fighter pilots, in total disregard of their own safety, attempted to take off in the face of greatly superior forces then attacking their aerodrome, but lost their lives in the attempt. A few fighter 'planes parked on an outlying gunnery training field, which was not attacked, took the air. The combined anti-aircraft and fighter action resulted in the destruction of approximately 30 enemy aircraft, and a number of others were lost at sea because they were unable to rejoin their carriers.

XIX. FEW FIGHTERS IN AIR.

The state of readiness prescribed for Army aircraft prior to the attack required them to be ready for flight only after four hours' notice. The type of alert in effect required all Army aircraft to be concentrated in order more effectively to guard against possible sabotage, instead of being dispersed in order to afford greater security against air attack, and greater facility in taking the air. This state of readiness, this concentration of aeroplanes, and the element of surprise, all contributed to the effectiveness of the Japanese attack, and resulted in such permanent or temporary disablement of aeroplanes that very few fighter aeroplanes were able to take the air during the course of the action. For the same reasons it was impossible to get aeroplanes into the air in time to trail the Japanese aeroplanes back to their carriers.

The aircraft warning system, which was remanned by about 8.30 a.m., December 7, 1941, failed during the balance of that day to furnish any reliable information of enemy aircraft returning to their carriers. Such information as it afforded indicated enemy forces, to the southward and southwestward of Oahu. A report of an actual contact with an enemy carrier which later proved to be erroneous, gave credence to numerous reports from other sources indicating enemy carriers might be to the southward and southwestward, thus causing futile searches in these areas.

On December 7, Naval Task-Force 8 was about 200 miles west of Oahu proceeding toward Oahu. Another was about 700 miles west of Oahu. A third, Task-Force 11, was in the vicinity of Johnston Island, about 700 miles southwest of Oahu. These task-forces were engaged in operations connected with strengthening the defences of the outlying islands.

On the morning of December 7, 1941, prior to the attack, the following searches of sea areas were being made. Six patrol 'planes were searching south and southeastwardly from Midway. Three patrol 'planes were in the air engaged in a joint exercise with submarines south of Oahu. Eighteen scouting 'planes from Task-Force 8 had been dispatched to scout in advance of the force which was on its way to Oahu. These scouted to the southwestward of Oahu. After the attack the following searches were made:

The three 'planes in the air south of Oahu, according to their standing orders, searched to the northwest of Oahu, a distance of about 375 miles. Nine 'planes were dispatched by Task-Force 8 and searched to the south and southwest of Oahu. Carrier 'planes of Task-Force 11 searched in an area about 500 miles southwestward of Oahu. About 11.27 a.m., two heavy Army bombers and four light bombers took off to attack a carrier reported about twenty-five miles off Barber's Point. After failure to

make contact the two heavy bombers searched first to the southwestward and then in areas to the northwest of Oahu. The other four searched to the southwestward of Oahu.

At 11.50 a.m. six Navy VS 'planes searched southward of Oahu. Thereafter nine 'planes searched the sector northward of Oahu to a distance of 300 miles, and nine 'planes which had arrived from carriers and refuelled searched some 200 miles to the northward. No contacts were made with enemy aircraft or carriers, except that one Navy aeroplane was attacked by a Japanese aeroplane some 300 miles north of Oahu. This incident was not reported until the next day.

SUMMARY OF THE MORE IMPORTANT FACTS.

Pearl Harbour is an important outlying naval base, and its security is vital to both offensive and defensive operations. It is the Army's function to ensure the security of Pearl Harbour against hostile attack, and the Navy's function to support the Army indirectly by operations at sea and directly by making available therefor such instrumentalities of the Navy as are on the vessels of the fleet when in harbour and are located or based on shore either temporarily or permanently.

Effective utilization of the military power of the Nation is essential to success in war and requires that the operations of the Army and the Navy be co-ordinated. Under the then existing plans the joint defence of the Hawaiian frontier was to be co-ordinated by mutual co-operation between the commanders concerned.

Plans for the defence of the Hawaiian coastal frontier were prepared by the Commanding General, Hawaiian Department, and the Commandant of the Fourteenth Naval District, the latter acting as a subordinate of the Commander-in-Chief of the Pacific Fleet.

Adherence to such a plan prepared in advance of hostilities does not suffice to relieve commanders of their responsibility to apply and adapt the plan to the situation as it develops.

Whereas here the defence of an area is the joint responsibility of two commanders who are to co-ordinate their activities by mutual co-operation, the first duty of such commanders in the case of an emergency is conference and consultation with respect to the measures to be taken under the existing plans and the adaptation of those plans in whole or in part to the situation.

At about the time that Admiral Kimmel and General Short assumed their respective commands, the War and Navy Departments were in correspondence with respect to adequate defence against air raids on Oahu and the naval base. The correspondence between the departments exhibits a deep concern respecting the probability of this form of attack. These commanders were acquainted with this correspondence.

RAID CAME UNEXPECTEDLY.

Nevertheless, there has been among the responsible commanders and their subordinates, without exception, a conviction, which persisted up to December 7, 1941, that Japan had no intention of making any such raid. Consequently this form of attack was a complete surprise to all of the superior officers of the Army and Navy stationed in the Hawaiian area.

This conviction persisted notwithstanding messages containing warnings and orders, brought to the attention of both commanders over a

period of weeks prior to the attack. As early as October 16 the commanders were warned of the possibility of an attack by Japan on the United States and were directed to take precautions and make preparatory dispositions in the light of this information. A significant warning message was communicated to both the local commanders on November 24. On November 27 each responsible commander was warned that hostilities were momentarily possible. The warnings indicated war, and war only.

Both of these messages contained orders. The Commanding General was ordered to undertake such reconnaissance and other measures as he deemed necessary. The Commander-in-Chief of the Fleet was ordered to execute a defensive deployment in preparation for carrying out war tasks. Other significant messages followed on succeeding days. These emphasized the impending danger and the need for war readiness.

In this situation, during a period of 10 days preceding the Japanese attack, the responsible commanders held no conference directed to a discussion of the meaning of the warnings and orders sent them, and failed to collaborate and to co-ordinate defensive measures which should be taken pursuant to the orders received. Dispositions as a result of the messages were independently made by each commander. Neither of them informed himself of the measures and dispositions taken by the other.

LACK OF INFORMATION FOUND.

The dispositions so made were inadequate to meet a surprise air attack.

Both commanders were handicapped by lack of information as to Japanese dispositions and intent. The lack of such knowledge rendered more urgent the initiation of a state of readiness for defence.

The personnel, material and equipment were insufficient to place the forces on a war footing and maintain them on that footing for an extended period. These deficiencies did not preclude measures which would have to a great extent frustrated the attack or mitigated its severity.

Army and Navy personnel were on pass or liberty December 6, for the reason that the state of alert or of readiness demanded by the emergency had not been put into effect. With immaterial exceptions Army and Navy personnel had returned from leave and liberty hours before the attack ensued, fit for duty.

Both officers and men responded immediately in the emergency and exhibited initiative, efficiency and bravery in meeting the raid.

CONCLUSION.

Based upon its findings of fact, the Commission reaches the following :

1. Effective utilization of the military power of the nation is essential to success in war and requires : First, the co-ordination of the foreign and military policies of the nation ; and, second, the co-ordination of the operations of the Army and Navy.

2. The Secretary of State fulfilled his obligations by keeping the War and Navy Departments in close touch with the international situation and fully advising them respecting the course and probable termination of negotiations with Japan.

3. The Secretary of War and the Secretary of the Navy fulfilled their obligations by conferring frequently with the Secretary of State and with each other and by keeping the Chief of Staff and the Chief of Naval Opera-

tions informed of the course of the negotiations with Japan and the significant implications thereof.

4. The Chief of Staff and the Chief of Naval Operations fulfilled their obligations by consulting and co-operating with each other, and with their superiors, respecting the joint defence of the Hawaiian coastal frontier; and each knew of and concurred in the warnings and orders sent by the other to the responsible commanders with respect to such defence.

5. The Chief of Staff of the Army fulfilled his command responsibility by issuing a direct order in connection with his warning of probable hostilities, in the following words: "prior to hostile Japanese action you are directed to undertake such reconnaissance and other measures as you deem necessary."

6. The Chief of Navy Operations fulfilled his command responsibility by issuing a warning and by giving a direct order to the Commander-in-Chief, Pacific Fleet, in the following words: "this dispatch is to be considered a war warning"; and, "execute an appropriate defensive deployment preparatory to carrying out the tasks assigned."

FAILED TO CONFER ON PLANS.

7. The responsible commanders in the Hawaiian area, in fulfilment of their obligation so to do, prepared plans which, if adapted to and used for the existing emergency, would have been adequate.

8. In the circumstances the responsibility of these commanders was to confer upon the question of putting into effect and adapting their joint defence plans.

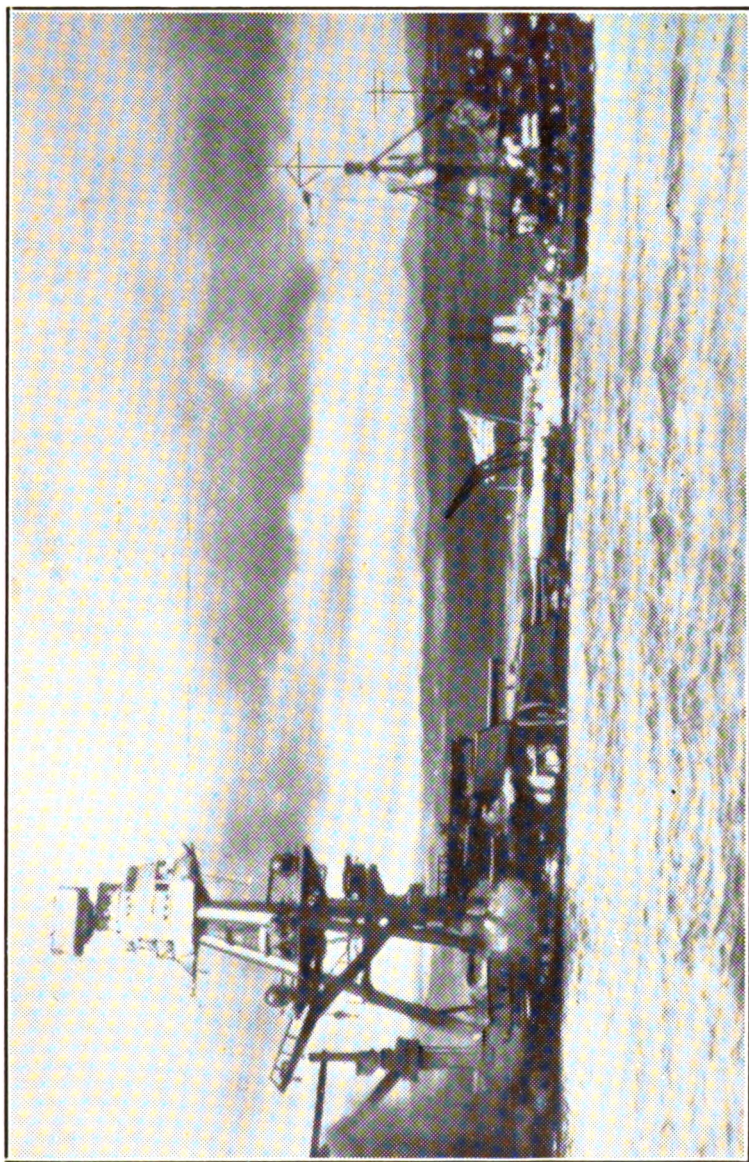
9. These commanders failed to confer with respect to the warnings and orders issued on and after November 27, and to adapt and use existing plans to meet the emergency.

10. The order for Alert No. 1 of the Army command in Hawaii was not adequate to meet the emergency envisaged in the warning messages.

11. The state of readiness of the naval forces on the morning of December 7 was not such as was required to meet the emergency envisaged in the warning messages.

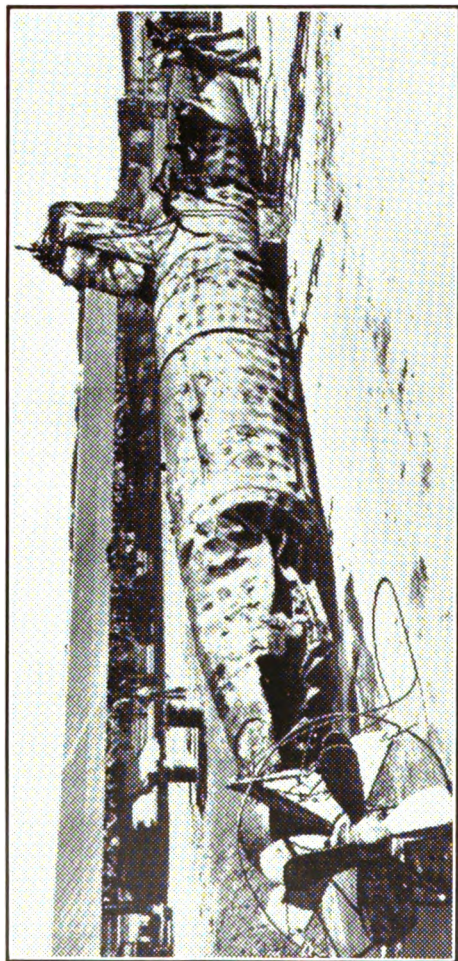
12. Had orders issued by the Chief of Staff and the Chief of Naval Operations November 27, 1941, been complied with, the aircraft warning system of the Army should have been operating; the distant reconnaissance of the Navy and the inshore air patrol of the Army should have been maintained; the anti-aircraft batteries of the Army and similar shore batteries of the Navy, as well as additional anti-aircraft artillery located on vessels of the fleet in Pearl Harbour, should have been manned and supplied with ammunition, and a high state of readiness of aircraft should have been in effect. None of these conditions was in fact inaugurated or maintained for the reason that the responsible commanders failed to consult and co-operate as to necessary action based upon the warnings and to adopt measures enjoined by the orders given them by the Chiefs of the Army and Navy Commands in Washington.

13. There were deficiencies in personnel, weapons, equipment and facilities to maintain all the defences on a war footing for extended periods of time, but these deficiencies should not have affected the decision of the responsible commanders as to the state of readiness to be prescribed.



U.S.S. Arizona, sunk at Pearl Harbour, December 7, 1941.

(*'Wide World' photo.*)



A Japanese two-man submarine, sunk and subsequently salvaged by the American Navy at Pearl Harbour.

WARNING MESSAGE TOO LATE.

14. The warning message of December 7, intended to reach both commanders in the field at about 7 a.m., Hawaiian time, December 7, 1941, was but an added precaution, in view of the warnings and orders previously issued. If the message had reached its destination at the time intended, it would still have been too late to be of substantial use, in view of the fact that the commanders had failed to take measures and make dispositions prior to the time of its anticipated receipt which would have been effective to warn off the attack or to meet it.

15. The failure of the officers in the War Department to observe that General Short, neither in his reply of November 27 to the Chief of Staff's message of that date, nor otherwise, had reported the measures taken by him, and the transmission of two messages concerned chiefly with sabotage which warned him not to resort to illegal methods against sabotage or espionage, and not to take measures which would alarm the civil population and the failure to reply to his message of November 29 outlining in full all the actions he had taken against sabotage only, and referring to nothing else, tended to lead General Short to believe that what he had done met the requirements of the warnings and orders received by him.

16. The failure of the Commanding General, Hawaiian Department, and the Commander-in-Chief, Pacific Fleet, to confer and co-operate with respect to the meaning of the warnings received and the measures necessary to comply with the orders given them under date of November 27, 1941, resulted largely from a sense of security due to the opinion prevalent in diplomatic, military and naval circles, and in the public press, that any immediate attack by Japan would be in the Far East. The existence of such a view, however prevalent, did not relieve the commanders of the responsibility for the security of the Pacific Fleet and our most important outpost.

DERELICTION OF DUTY.

17. In the light of the warnings and directions to take appropriate action, transmitted to both commanders between November 27 and December 7 and the obligation under the system of co-ordination then in effect for joint co-operative action on their part, it was a dereliction of duty on the part of each of them not to consult and confer with the other respecting the meaning and intent of the warnings and the appropriate measures of defence required by the imminence of hostilities. The attitude of each, that he was not required to inform himself of, and his lack of interest in, the measures undertaken by the other to carry out the responsibility assigned to each other under the provisions of the plans then in effect, demonstrated on the part of each a lack of appreciation of the responsibilities vested in them and inherent in their positions as Commander-in-Chief, Pacific Fleet, and Commanding General, Hawaiian Department.

18. The Japanese attack was a complete surprise to the commanders and they failed to make suitable dispositions to meet such an attack. Each failed properly to evaluate the seriousness of the situation. These errors of judgment were the effective causes for the success of the attack.

19. Causes contributory to the success of the Japanese attack were: Disregard of international law and custom relating to declaration of

war by the Japanese and the adherence by the United States to such laws and customs.

Restrictions which prevented effective counter-espionage.

Emphasis in the warning messages on the probability of aggressive Japanese action in the Far East and on anti-sabotage measures.

Failure of the War Department to reply to the message relating to the anti-sabotage measures instituted by the Commanding General, Hawaiian Department.

Non-receipt by the interested parties, prior to the attack, of the warning message of December 7, 1941.

20. When the attack developed on the morning of December 7, 1941, the officers and enlisted men of both services were present in sufficient number and were in fit condition to perform any duty. Except for a negligible number, the use of intoxicating liquor on the preceding evening did not affect their efficiency.

21. Subordinate commanders executed their superiors' orders without question. They were not responsible for the state of readiness prescribed.

Respectfully submitted,

Owen J. Roberts,
W. H. Standley,
J. M. Reeves,
Frank R. McCoy,
Joseph T. McNarney.

CHAPTER VI.

AIRCRAFT VERSUS SHIPS.

"The day of Britain's might at sea is past. Aircraft and the U-boat have turned surface fleets into the obsolete playthings of the wealthy democracies. They are no longer a serious weapon in decisive warfare." (*Hitler Speaks*, by Hermann Rauschning, p. 129.)

THERE was no more controversial subject, before the war, both in the Services and in the Press, than that of aircraft versus ships. The arguments, though applied to all classes of ship, war and mercantile, to a greater or lesser extent, were focused on the capital ship, and in Parliament and in the Press the subject became known as the "Bomb versus Battleship" controversy. This controversy has also cropped up from time to time during the war.

On the one hand, the aircraft enthusiasts contended that, in the event of war, all warships, to say nothing of merchantmen, which ventured within range of an enemy's aerodromes, or aircraft carriers (of which Germany and Italy had none) would be sunk by bombs. On the other hand, the anti-aircraft enthusiasts—which is not intended to include the Admiralty and the Navy *en bloc*—argued that :

1. A.A. guns would either keep aircraft at a height from which the number of bomb hits would be small, or shoot them down ;

2. A ship was a comparatively narrow and elusive target, owing to its speed and manœuvrability, and as with the case of shells—of which only 3 per cent. were hits at the Battle of Jutland—few bombs were likely to hit their targets ; and

3. Increased horizontal armour would provide protection, particularly in capital ships, to enable the ship to withstand the explosion of one or more bombs in the same way as it had done in the case of plunging projectiles.

The Admiralty opinion was expressed by the Parliamentary Secretary (Mr. G. Shakespeare, M.P.), in introducing the Navy Estimates for 1939, when he stated :

"Modern ships can produce a volume of defensive fire . . . that will drive aircraft to such a height that the efficiency and accuracy of their attacking weapons will be seriously impaired . . . and the target ship may be altering course. . . . Protection against plunging fire is the primary consideration of the designer . . . and the shell will strike a ship with two or three times the kinetic energy or smashing power of the bomb. If the designer has provided sufficient protection against plunging shell fire, he has provided sufficient protection against the bomb." (*Hansard*, March 16, 1939, cols. 657-9.)

After two-and-a-half years of war, and experience of German, Italian and Japanese air attacks, it is of interest to examine the results from the British ship point of view and attempt to ascertain what conclusions should be drawn and whether the right counter-measures have been taken.

The pattern of aerial strategy visualised against ships was based on the likely use of them by ourselves and the enemy. This use could be seen quite clearly. Germany, with a small fleet of only 47 warships of destroyer type and above, of which only a small number would venture out on the high seas, and even these be confined to the use of German bases, would provide few targets for our aircraft. The British Navy, however, with 360 seagoing warships—other than submarines—distri-

buted over the seven seas, would provide many targets for enemy attack.

The possibility of being able to bomb a large enemy warship and so cripple her as to enable other warships of equal or slower speed, otherwise unable to overtake her, to do so and inflict mortal damage was generally appreciated. But, though the British Navy had greatly developed the use of torpedoes by aircraft, the Germans and Italians had failed to develop this method.

When war began the Navy expected early aircraft attacks on our ships and bases ; but, in fact, it was the British who on the second day first tested these possibilities. As the larger German ships were not at sea they had to be attacked in harbour, so the first offensive task of the R.A.F. was a daylight bombing raid on ships in the Kiel Canal area. Hits were believed to have been scored on the battle-cruiser *Gneisenau* and another ship, one being badly damaged, but five of our aircraft were lost. At the time, it was considered that the results justified the losses.

FIRST NORTH SEA ATTACKS.

The first attack by German aircraft on our warships did not materialise for three weeks, when 20 aircraft attacked a portion of the Home Fleet, comprising capital ships, an aircraft carrier, and a cruiser squadron, in company with destroyers, some of which were escorting the damaged submarine *Spearfish*—altogether an ideal ship target for aircraft.

High-level precision (so-called) bombing and half-hearted "dive-bombing" attacks were made, but no ship was hit and even "near misses" did no damage ; two enemy aircraft were brought down and another damaged. This was the first occasion on which German airmen had to face the intensive anti-aircraft barrage from warships, which undoubtedly proved a deterrent ; the attacks were easily countered by our ship-borne fighters and the ships' A.A. fire. It can rightly be claimed that the aircraft were defeated in this first contest.

The second German attack was made twelve days later (October 9) on a British cruiser squadron, with attendant destroyers, but without aircraft protection. Some 30 aircraft attacked, on and off, for about eight hours. The weather was so bad that one destroyer, when attacked by more than one machine, had to turn stern to sea in order to fight her guns. Conditions were not, therefore, favourable for stable A.A. gun platforms. In the earlier attacks both high-level, from 5,000 feet, and diving attacks were made, but no bomb fell within 400 yards of a ship. The squadron was later attacked repeatedly for about five hours, during which time over a 100 bombs were dropped but, though one fell sufficiently near to send splinters on board a cruiser, some bombs missed by as much as a mile. No ship was hit, but four enemy aircraft were forced to land in neutral territory, while two others were believed to have come down in the sea.

This was the first enemy air attack on ships unprovided with aircraft defence and, though the German pilots exhibited a good deal of determination, the ships' A.A. barrage prevented any hits. The result was a definite failure of the bomber to achieve any results and a qualified success for A.A. gunfire against small air forces, though how far the high speed and good manœuvrability of the cruisers contributed to this success is not known.

Thwarted in their attacks against moving targets at sea, a week later (October 16), the Germans decided to test the initial British plan of attacking stationary ships in harbour. Fourteen bombers raided ships in the Firth of Forth, but with an apparent respect for the ships' A.A. fire, for the bulk of the attacks were delivered in glides from 6,000 to 1,500 feet. The cruiser Southampton was hit near the bridge with a bomb which glanced off and sank two boats alongside. "Near misses," however, caused casualties in three ships, three in the Southampton, seven in the cruiser Edinburgh and twenty-five in the destroyer Mohawk, mostly on the crowded forecastle, as she was entering harbour and preparing to anchor. R.A.F. fighters and ship and shore A.A. fire destroyed seven enemy aircraft without any British aircraft losses. Though somewhat more effective than the attacks at sea, the success was inconsiderable since the ships remained fit for service. There was no balloon barrage in the Firth at the time, but one was immediately established and the enemy did not repeat his attack.

Next day fourteen aircraft made two bombing raids on the Home Fleet base at Scapa Flow, in the first of which the depôt-ship Iron Duke was damaged by a "near miss." There were no British casualties, but two of the raiders were shot down.

Apparently the Germans did not consider the small amount of success achieved in attacking warships in harbour justified the risk and possible loss of aircraft, for some period elapsed before these attacks were repeated on any scale. By that time the A.A. defences of Scapa Flow had been improved and, with them, R.A.F. and Fleet Air Arm fighters took their toll of enemy aircraft. It may justly be claimed that the initial enemy air attacks both against warships at sea (with and without aircraft protection) and in harbour were defeated, and during the remainder of 1939 no further attempts were made on squadrons at sea or large ships in harbour.

ATTACKS ON MERCHANT SHIPS.

Foiled, apparently, in their attacks on warships the enemy turned to North Sea convoys, which by virtue of the number of merchant ships and their slow speed offered easier targets. The first convoy raid occurred four days after those on Scapa Flow, some 21 bombers being employed. Few, if any, merchant ships then had A.A. guns, but the barrage of the escort was such that the machines were unable to reach an attacking position and, being also engaged by R.A.F. fighters, five enemy planes were shot down. This attack was a complete failure and disproved the pre-war theory that the convoy system, while efficacious against submarine attack, would increase the chances of success by enemy bombers. Convoy attack was not repeated on any scale during the remainder of 1939.

Lack of success with ordinary mines, as well as bombing attacks, against ships caused the enemy to turn to the magnetic mine—Hitler's so-called "secret weapon"—and from mid-November aircraft were diverted from bombing to lay these mines around our coast. The failure of this plan, and how it was defeated, lies outside the scope of this chapter.

In December, 1939, German air attack began on lone merchant ships, particularly neutrals, and 32 fishing vessels and small craft, which were totally unarmed and without any protection, were attacked. These vessels were bombed and machine-gunned apparently in an effort to

terrorise the crews into ceasing to go to sea. If this were the object it failed completely.

During the four months of 1939 enemy attack on ships had been marked by a lack of planning and initiative and a process of deterioration, from warships at sea to warships in harbour; from merchant ships in convoy to the single unprotected vessel unable to defend herself from a new form of murder from which she should have been immune. All these forms of attack were to be intensified later, but so far German aircraft had only a poor dividend to show for the losses incurred.

1940.

The early part of 1940 gave no clear indication of any definite plan of German air attack at sea, and the first warship to be sunk in the war by bombing was not lost until February 3. This was a minesweeper, the *Sphinx*, and she survived the attack, capsizing two days later in heavy weather while being towed into harbour. Full-scale enemy raiding may be said to have begun in March, and, strangely enough, with an attack on the Fleet at Scapa Flow. In this month also the Fleet Air Arm received its first mention in an official communique in the defence of a convoy; merchant shipping was then being attacked indiscriminately.

The bombing opened with a dusk raid on Scapa Flow on March 16—shortly after the Home Fleet had returned to harbour—in which it was stated that 14 German aircraft took part, though the number was later considered to have been higher. The enemy claimed to have hit three capital and one other ship, but this was denied. The First Lord of the Admiralty (Mr. Churchill) later stated in Parliament that one cruiser was hit, which necessitated several weeks of repair. Our reply was a seven-hour raid by the R.A.F. on Hornum, Sylt, three days later when 45 tons of bombs were dropped. Three raids were made on Scapa Flow in April; and on April 10, the day after the invasion of Norway and Denmark, 60 aircraft were used; but the Fleet Air Arm co-operated with the R.A.F. and enemy losses were estimated as eight. Heavy and accurate A.A. fire from the ship and shore defences prevented accurate bombing and little damage was done.

NORWEGIAN CAMPAIGN.

The German invasion of Norway on April 9, 1940, caused a new development in the air war at sea, the attack being mainly directed against warships, in particular against ships of both sides in the various harbours.

In the deep sea operations, our ships had to withstand a good deal of aerial attack from time to time. On the first day the Home Fleet was repeatedly attacked when off Bergen and the flagship, H.M.S. *Rodney*, was hit by a large bomb which, however, did scarcely any damage. The cruiser *Aurora* received much attention but escaped, though two other cruisers were slightly damaged by "near misses." The destroyer *Gurkha*, attacked by a formation of 30 Dornier bombers, was hit and severely damaged and, though she remained in action and was taken in tow, sank four-and-a-half hours later.

The air attack on enemy ships opened on the first evening when 24 R.A.F. bombers attacked four German warships at Bergen and reported hits on a cruiser, though this was later considered to be doubtful. The

following morning 16 Fleet Air Arm dive-bombers repeated the attack and scored three hits on the only cruiser then present, which sank. This claim was confirmed in an account by a local journalist. R.A.F. reconnaissance that evening reported a large cruiser, believed to be the *Hipper*, at Trondheim, and next day at dawn a force of 18 Fleet Air Arm torpedo aircraft attacked but no cruiser was there. They found a destroyer, torpedoed and sank her—the first aircraft torpedo success of the war.

Naval aircraft operating from carriers and ships supported the R.A.F. in inshore operations throughout the campaign in several successful attacks on ships, aerodromes and other targets—in fact, in the north the Army was obliged to rely on the Fleet Air Arm for their air support.

At sea, a week after the Home Fleet attack (April 17), the Germans had a fine opportunity to attack a single British cruiser which for eighty minutes before dawn had bombarded Stavanger aerodrome. Fleet Air Arm aircraft, which had carried out spotting duties, provided a certain amount of protection for her withdrawal, shooting down two aircraft and damaging three others. The ship escaped 114 bombs, but was hit by one which did considerable damage. Nevertheless, she returned to her base.

Two other ships were damaged by bombs on other occasions, but no details were given. The destroyer *Eclipse* was damaged by a “near miss” during a bombing attack but was towed back to port, and the French cruiser *Emile Bertin* was hit on her superstructure by a heavy bomb, but it caused little damage and no casualties.

Although the enemy had the advantage of local aerodromes, and soon obtained the ascendancy in the land operations, their bombers had remarkably little success against our ships—even trawlers—in harbour. Some of these small craft were sunk and others damaged, a few being sunk by our own forces because it was not possible to tow them back to Britain. The only notable success in the Central campaign was the loss of the anti-aircraft sloop *Bittern* at Namsos, but even this ship was finally sunk by a British torpedo to avoid damage to other ships.

The most hazardous phase of the campaign was the withdrawals, as the enemy was generally aware of them and able to attack the convoys. Two destroyers, the British *Afridi* and the French *Bison*, escorting the Namsos convoy on May 3 were hit and sank later, but no transport was sunk. In the Narvik area on the same day the Polish destroyer *Grom*, escorting a convoy with other ships, was sunk. The largest warship lost by bombing was the anti-aircraft cruiser *Curlew*, three weeks later, in the Narvik area—the first British cruiser to be lost in nearly nine months of war.

The results of enemy air attack on British and Allied warships, as far as they were announced, during the two-months' Norwegian campaign were approximately :

Lost : At sea, four destroyers, two British, one French and one Polish ; in harbour, one cruiser, one sloop and nine trawlers, all British—total 15.

Damaged : At sea, one battleship (slightly), four cruisers—three British and one French (three slightly)—and one destroyer—total 6.

NOTE.—Details of ships damaged in harbour were not announced.

The results of the Norwegian campaign showed that an appreciable military force could be successfully transported some 400 to 1,000 miles across the North Sea to Norway and, despite eventual enemy local air superiority, maintained there by the Navy and finally withdrawn without undue loss. In fact, the enemy's greatest success, the sinking of an aircraft

carrier, two destroyers, a transport and tanker was by surface ships. It also showed, however, that such operations could be appreciably hampered by enemy shore-based aircraft and that under such conditions losses must be expected, particularly among the inshore light craft. But, whereas the German Navy had proportionately suffered serious losses, including some of the more important ships of their fleet and several of their few destroyers, the strength of the British Navy was hardly impaired and we were able immediately to withdraw battleships from the Home Fleet to strengthen the Mediterranean. From the point of view of air attack on ships at sea American comment on the campaign is of interest, as it was to the effect that the Germans had shown themselves incapable of inflicting serious damage on the British Fleet by air bombing.

The German occupation of Norway obviously changed considerably the sea-air strategic situation between Britain and Germany. The enemy obtained certain advantages, from the air point of view, with aerodromes only some 300 miles from Scotland and the naval bases on the East Coast and at Scapa Flow. But, strange though it may seem, he had no further worthwhile aircraft successes against our warships at sea in 1940 or, for that matter, in 1941.

One of the reasons is that this occupation caused the cessation of all mercantile traffic with Scandinavia and no further convoys sailed to and from Norway. Consequently the demand for the Home Fleet to operate in the North Sea ceased, except to deal with such surface ships as might emerge, and the Commander-in-Chief was able to divert warships to shipping protection elsewhere. This area, so fruitful for U-boats and convoy raiders in the 1914-18 war, consequently became largely a "no-man's land." The result was that, although the Germans had the advantage of Norwegian ports and aerodromes, there were practically no ship targets for them to attack in the North Sea, except the few merchant ships of the two remaining neutrals, Sweden and Russia, the supplies of which they wanted.

CONTINENTAL WITHDRAWALS.

A month before the end of the Norwegian campaign, the German invasion of Holland and Belgium, on May 10, caused British destroyers, minesweepers, minelayers and other small craft to operate off their coasts and in their ports, in spite of the close proximity of enemy aerodromes, to support the local forces in any way possible, maintain communications with Britain, and assist and protect withdrawals by sea. From the first these ships were the targets for intense bomb and machine-gun attack, as well as magnetic mines laid by aircraft. The chief demand for the destroyers was for A.A. defence of ships bringing away refugees. Fortunately, throughout the five days' Dutch operations, although there were many narrow escapes and some British ships were slightly damaged, none was lost or even seriously affected.

Similar immunity did not continue during the next five weeks' operations off the Belgian and French coasts. Three British destroyers, supporting the Allied Armies' flank with A.A. fire, were early bombed and lost, though two were beached, and a French destroyer was lost off the coast of Holland.

The main operation, however, was the withdrawal of the Allied Armies from Dunkirk, when for seven days a flotilla of 222 naval vessels, assisted by 665 other craft, in an almost constant procession across the Straits of

Dover, carried away from the port and open beaches 335,000 Allied troops. This amphibian operation brought about the first big clash between the *Luftwaffe* and the R.A.F., albeit the latter was supported, if only to a limited degree, by naval aircraft and the small ships' A.A. fire. It was a scheme regarded by many as "impossible" because of a belief, which proved to be mistaken, that the enemy would secure local air superiority and then bomb embarkation points at leisure and also prevent ships from reaching the necessary positions.

The Germans announced their intention not to allow the Army to escape and threw in large numbers of aircraft in an attempt to prevent it, but in spite of the almost incessant air battle enemy bombers were kept in check whenever it was possible to maintain our fighter patrols. The R.A.F., however, had not sufficient aircraft for constant patrols and during their absence on the first day alone three destroyers and two trawlers were lost. Eventually embarkation had, at times, to cease in daylight. The total losses were six destroyers, a minesweeper, gunboat and Fleet Air Arm tender, and 21 other minor war vessels out of the 170 employed. Later it was announced that 70 destroyers needed dockyard repairs. The losses, though comparatively serious, were not so heavy as might have been expected.

The whole episode showed that, given sufficient air cover, destroyers and similar small ships could enter a port under attack from the air and in the later stages from artillery, remain there for a sufficient period to embark troops and return successfully. But in such circumstances losses and damage to a number of ships would have to be accepted. The saving of such a large number of troops, however, was well worth the cost.

Several similar withdrawals, though on a smaller scale, were later carried out farther along the French north and west coasts, but they call for no particular comment, except for the typical German murder bombing attacks on hospital ships. The worst outrages were the deliberate bombing of two such ships in Dieppe harbour, on May 21, and two others off the French coast twelve days later. The transport *Lancastrian* was also sunk by bombs off St. Nazaire just before sailing with some 5,000 troops and civilians on board, only about half of whom were saved and brought away by other ships.

MEDITERRANEAN.

Italy's declaration of war on June 10 turned the Mediterranean, Red Sea and Indian Ocean into combat zones and, with the capitulation of France, presented a far different sea-air strategical pattern. The Italian Navy was numerically superior to the British forces in the Mediterranean and, furthermore, it could be concentrated, whereas ours had to be divided between Gibraltar and Alexandria. With the Italian peninsula almost across the Central Mediterranean, Libya on the opposite shore, and the Dodecanese Islands, Italy also had the geographical advantage and, though she had no aircraft carrier, the aerial advantage of aerodromes from which aircraft could practically cover the whole of the Mediterranean. British naval bases and aerodromes on the other hand were limited to Gibraltar (of restricted air value), Malta, threatened with the full weight of Italian air attack, Egypt and the limited resources of Palestine and Cyprus. As events were to show, however, usually our Western Squadron had an aircraft carrier with it and the Main Fleet in the eastern basin one or more.

Italy's merchant ships ceased to voyage overseas and British mercantile traffic had been diverted round the Cape from April 30; thus no purely merchant ships were at sea in the Mediterranean after the first few days—except for the limited British trade maintained in the Levant.

Again, as British warships were frequently at sea, numerous targets were provided for the enemy, but our targets were comparatively few. Both sides, however, had to send military supplies overseas—ours to Malta and Egypt and Italian to Libya and the Dodecanese—and as these were legitimate targets they were convoyed as far as possible. It therefore seemed that the most likely cause of clashes at sea would be attacks on these convoys.

The opening move against Britain in Italy's war effort was immediate air raids on Malta, Mussolini doubtless being inspired by no less an air authority than Air Marshal Sir John Salmond who, in an article in the *Evening Standard*, November 11, 1935, had written:

"Malta, under air bombardment, which it is possible to bring from hostile shore bases, would be in ruins in forty-eight hours."

Contrary, however, to the Air Marshal's prophecy, owing to the heavy toll of aircraft taken by fighters, the shore defences, and ships' gunfire, the attacks became less and less effective. Despite revivals, with growing intensity early in 1942, Malta still stands in full action as Britain's bastion in the Central Mediterranean.

The first combined naval and air operation on any scale in the Mediterranean—in fact anywhere in the war to date—was, however, not against our enemy Italy but our late ally France, in the attack on the French ships at Oran on July 3, 1940, to prevent their falling into enemy hands and being used against us. Fleet Air Arm aircraft took part with bombs, but what success was achieved by gunfire and bombs was not known. Torpedo aircraft attacked the battle-cruiser *Strasbourg* escaping to Toulon, but despite one hit her speed was sufficient to outstrip the ships sent in pursuit. Three days later, to ensure the only other battle-cruiser, *Dunkerque*, being out of action—the French Admiral publicly stated she had been evacuated—the Fleet Air Arm dropped six more bombs on her, without the loss of any aircraft. Two days afterwards a torpedo attack by the Fleet Air Arm formed part of the assault against the new 35,000-ton battleship *Richelieu* at Dakar. Five torpedoes hit and certainly put the ship out of action but, being in shallow water, she simply settled on the bottom. The damage was considered to be such that the ship could not be rendered serviceable without docking, and the nearest dock was thousands of miles away in France.

Within a month (July 7–12) of Mussolini's declaration of war the 2,000-mile through convoy route in the Mediterranean was put to the test with the passage of reinforcements for General Wavell's Army of the Nile. British naval forces were at sea in strength, the Western Squadron escorting the convoy from Gibraltar to the Central Mediterranean where it was transferred to the Main Fleet. This fleet, on its way westward from Alexandria, was attacked by Italian aircraft and one bomb hit the bridge of the cruiser *Gloucester*, killing the captain and other officers, but the ship continued in company. Next day an Italian force of battleships, cruisers and destroyers was sighted by our reconnaissance aircraft. A momentary engagement occurred, the range never being less than 28,000 yards, and once an enemy battleship was hit the whole force

retreated at full speed. Torpedo aircraft attacked and hit a cruiser but she escaped. Constant bomb attacks by enemy shore-based aircraft failed to hit our ships. During the two days July 11-12, several heavy raids were made on Admiral Cunningham's fleet but no ship was hit, the only casualties being three from "near misses." Fleet fighters shot down five enemy aircraft and 15 others were claimed by A.A. fire. The Western Squadron was also continuously attacked but with even less success, as no ships were damaged and there were no casualties.

This first passage of a through Mediterranean convoy was entirely successful, except for the minor damage to the Gloucester. The Italian air menace had been defeated and their fleet had been drawn out to sea with the consequent risk of damage from our ships (one Italian battleship had nearly 100 casualties), aircraft and submarines.

A large troop convoy was taken through the Mediterranean early in September. In the western basin a fleet fighter shot down an enemy reconnaissance machine, and in the eastern basin during an attack by dive-bombers south-west of Malta five attackers were shot down by fleet fighters and four more chased back to Sicily. The dive-bombers on this occasion were Junkers 87, the first appearance of German aircraft in the Mediterranean, though they were probably manned by Italians.

At the end of September the Mediterranean Fleet was again at sea in the eastern basin to cover the passage of reinforcements to Malta. Three air attacks were made on it; two by high bombing and the third by torpedo aircraft which concentrated on an aircraft carrier. One aircraft was shot down by A.A. fire and during the cruise fleet fighters shot down three reconnaissance machines. On neither of these occasions was any damage caused to our ships.

A fortnight later (October 12) the fleet was attacked at sea by aircraft for four hours, but suffered no damage and four machines were shot down. The following day a torpedo aircraft succeeded in hitting the cruiser Liverpool—the first enemy torpedo success—but her casualties were not heavy and she arrived safely at Alexandria.

On the night of November 11 the Fleet Air Arm made their remarkably daring and highly successful torpedo attack on the main Italian battle fleet at Taranto—the most notable of all air actions to date. Eleven torpedo aircraft and ten bombers from the carriers *Illustrious* and *Eagle* took part and three battleships, two cruisers and two auxiliaries were damaged for the loss of only two aircraft. In one naval air attack half the Italian battle fleet had been put out of action, mainly by torpedoes.

On November 27, our Western Squadron encountered a stronger enemy force, including the battleship *Vittorio Veneto* and another battleship. A momentary engagement occurred and then the enemy fled at high speed. Fleet torpedo aircraft attacked and claimed hits on the *Vittorio Veneto* and one heavy cruiser, and bombers damaged a light cruiser. Despite two enemy bomb attacks, none of our ships was hit, but two of their aircraft were shot down for the loss of one of our fighters. No further important air engagements took place in the Mediterranean in 1940.

The value of the torpedo as a more effective weapon than the bomb for sea-air warfare had been established and, after six months of warfare in the Mediterranean, it had been proved that the fleet, largely with its own resources of aircraft and A.A. gunfire, could defeat normal Italian aircraft attacks both on the fleet and the slower-moving convoys.

1941 MEDITERRANEAN CONVOYS.

The year opened with the first appearance of the *Luftwaffe* in the Mediterranean on January 10, when in the narrow bottle-neck of the Sicilian Channel heavy air attacks were made on the escorts of an important convoy bound for Greece. At least six attacks were made during a period of seven hours, between noon and dusk, by 80 or more German and Italian aircraft—a dozen being shot down—which mainly concentrated on the aircraft carrier *Illustrious*. The cruiser *Southampton* was hit by bombs, set on fire and had to be sunk by our own forces.

Details of the attacks on the *Illustrious* were given at the time by a Press correspondent who was on board and later in an Admiralty statement. The first attack was made by two Italian aircraft which fired torpedoes at the ship, but she avoided them. Before the first bomb hit all the *Illustrious* fighters managed to take off. The next raid, the heaviest of the day, was made by some 40 German dive-bombers in wave after wave on the Fleet, but concentrating on the *Illustrious* and, in spite of her fierce A.A. gunfire, avoiding action and her fighter aircraft, some heavy bombs hit. Some A.A. guns were put out of action, damage done between decks and several fires started, including a serious one in a hangar.

The *Illustrious* headed for Malta; she developed a list, her steering gear broke down, she had to be steered with her engines and great difficulties were experienced in the boiler rooms in maintaining steam. But the third attack by bombers was beaten off by the ship's aircraft, and the enemy dropped their bombs harmlessly in the sea. Soon afterwards 15 dive-bombers escorted by five fighters attacked, but the A.A. guns put up such a barrage that this attack was not pressed home. The first wave dived to the attack, and two bombs fell near; the second was no more successful, though one bomb scored a "near miss." The fifth attack was made when the ship was only a few miles off Malta, by 17 machines in a combined high level and dive-bombing attack, but they were fought off. The last alarm occurred in sight of the harbour when two torpedo aircraft appeared, but they were repulsed by gunfire and no attack developed. During these attacks nine German aircraft were destroyed, five by fleet aircraft and four by gunfire, seven more being damaged, at least two very severely.

Repeated enemy air attacks were made on Malta with the object of destroying the *Illustrious*, but little more damage was done to her. On the other hand the R.A.F., Fleet Air Arm and shore batteries in two or three days destroyed upwards of 90 enemy aircraft, 50 in the air and 40 on the ground on enemy aerodromes. As the Prime Minister stated in a broadcast on February 9, although the *Illustrious* was one of the greatest prizes of air and naval war, the Germans accepted defeat. They would not come any more.

The results of the attacks at sea, whereby a heavy cruiser was sunk and an aircraft carrier seriously damaged, was the greatest success which German bombers had yet, or since, scored against moving British warships, but they had to pay a fairly heavy price for it. It must be noted, however, that bombs did not actually sink the cruiser, no Italian torpedo aircraft scored a hit and the convoy, the passage of which caused the action, completed its 2,000-mile voyage unscathed.

The *Southampton* was only the third cruiser to be lost by enemy action in sixteen months of war, and she might equally well have been

sunk in an encounter with enemy ships, as were several in the 1914-18 war. The fact that the enemy did not sink the carrier, a class of ship with the largest deck area and most vulnerable to explosions and fires, was in itself a tribute to both her defence and construction.

Another convoy was attacked in the Mediterranean at the end of July. The main attacks were from the air—except for one by E-boats and another by a U-boat, which was believed to have been destroyed. But although Italian torpedo aircraft and high bombers and German Stukas were active throughout the three or four days the convoy was within range, they had little success.

On July 22 a combined torpedo and bombing attack was made during which the destroyer Fearless was torpedoed and set on fire. Her crew were taken off and she was sunk by our own ships. Three torpedo aircraft were shot down by A.A. fire and two of the bombers by fighters from the carrier Ark Royal, which completely broke up the attack. Further attacks throughout the day met with no success, but several more aircraft were shot down.

Next day a merchant ship was torpedoed during the E-boat attack, but she was able to continue with the convoy. Air attacks followed later, one by Stukas, of which one was shot down by A.A. fire. More combined torpedo and high-bomber attacks followed in which four aircraft were shot down by Ark Royal fighters and others damaged. Three of our aircraft were lost, but all their crews were saved, whereas the Italians lost 12 aircraft for certain and had four others probably destroyed. The convoy reached its destination.

Another convoy was attacked in the Mediterranean at the end of September, the escort in the western basin comprising battleships, cruisers and destroyers, and its passage produced a repetition of previous Italian air exploits. On the afternoon of September 27 three groups of torpedo aircraft, escorted by fighters, attacked our ships while bombers passed over them, but no attack by these was observed.

British fighter aircraft destroyed five enemy aircraft, probably another and damaged others, and six torpedo aircraft and one fighter were shot down by A.A. gunfire. The battleship Nelson was hit by one torpedo, but this only reduced her speed to 15 knots, she had no casualties and the aircraft was shot down. One ship of the convoy was hit but suffered no casualties, and as she could not be towed to port she was sunk by our forces. A second attack during the afternoon was intercepted and driven off by our fighters. Next day an enemy reconnaissance aircraft was destroyed, making a total for the operations of 13, as compared with our loss of three naval fighters, the crews of two of which were saved. The convoy, except for one ship, reached its destination.

The results of the Mediterranean convoy operations in 1941 showed that, although in the case of heavy and sustained attack by German pilots (as on January 10), more aircraft than those usually present with a squadron were necessary to ensure the safety of the ships, the successful passage of the other convoys, except for small losses or minor damage, also showed that, when it was necessary to take the risk, the Mediterranean route could be used as far as normal Italian air attacks were concerned.

ATTACKS ON HEAVY SHIPS.

The next phase of the air war at sea of importance in 1941 was the development of our aircraft attacks on enemy large ships, of which the

Battle of Cape Matapan, on March 28, was the first. Two Italian forces were at sea, comprising three battleships, eleven cruisers and fourteen destroyers, probably with the intention of attacking our convoys between Egypt and Greece. The British forces concerned were three battleships, one aircraft carrier, four cruisers and destroyers.

A torpedo attack was launched from the carrier *Formidable* on a *Littorio* class battleship at 11.30 a.m. and one hit was obtained. Shortly afterwards in a second attack another hit was claimed and during a third in the afternoon three hits were claimed on the same ship.

Between 3 and 5 p.m. R.A.F. bombers attacked the other Italian force and two hits were claimed on a cruiser, one on a destroyer and two probably on another cruiser. At four o'clock aircraft reported the speed of the battleship had been drastically reduced, and at dusk two more torpedo attacks were made. The aircraft could not reach the battleship, a cruiser was therefore attacked and definitely hit. This was the *Pola* and at 10.10 p.m. she was discovered stopped only three miles from our battle fleet's course. In closing the *Pola* the battle fleet sighted three other cruisers, and these were promptly sunk by our surface ships' gunfire.

The air attacks were spread over some eight hours, as compared with an actual fighting period between heavy ships of under five minutes, and five torpedo hits were claimed on the battleship, though unfortunately she escaped. But it was the damage inflicted during the afternoon by aircraft on the fleeing enemy that made it possible for the fleet to overhaul them. Our force suffered no loss or casualties—a victory without precedent—except for one aircraft, whereas two German dive-bombers and one Italian aircraft were shot down.

As comment on the action the Commander-in-Chief's message may be quoted: "The untiring efforts of the Fleet Air Arm kept me well informed of the enemy's movements, and the well pressed home attacks of torpedo bomber aircraft on the *Vittorio* so reduced the speed of the enemy Fleet that we were able to gain contact during the night and so inflict heavy damage."

A noteworthy feature of the action was that, although the Italian Fleet was at sea in force, their aircraft, admittedly limited to shore bases, played practically no part. This was the first engagement between ships on anything like the limited scale of a fleet action possible with the small fleets of this war, and it should be noted that the air weapon concerned in the main operations was the torpedo and not the bomb—although the R.A.F. used bombs on the second force of light vessels.

This action first demonstrated the most notable effect of aircraft on sea warfare in the age-old problem of "fixing" a mobile enemy unwilling to fight. In sailing ship days it was a frequent occurrence for the French or Spanish Fleets to refuse action, and in the 1914-18 war the Germans, both in the battle-cruiser engagement at Dogger Bank of 1915 and in the Fleet action at Jutland in 1916, refused action with the British Fleet seeking a decision.

No ship can outpace aircraft, so that the fastest squadron can be overtaken by an air force brought to the scene of action which, if in sufficient strength, may cripple, or even sink, one or more ships. But, though bombs can sink lighter ships, they cannot be relied on even to reduce the speed of a well-protected one. The torpedo, however, if it hits even the best protected ship, will almost inevitably slow her up and if it damages the propellers or other part of the steaming equipment, will cripple her.

Consequently a fleet with an air force armed with torpedoes now has the means of "fixing" an unwilling enemy, but, outside the range of shore bases, obviously this can only be achieved by carrier-borne aircraft.

THE CHASE OF THE BISMARCK.

This method was to succeed in the next air versus capital ship encounter in the four-and-a-half day, 1,750-mile chase of the Bismarck during May 23-27—the Fleet Air Arm's most notable success so far. This chase provided an illuminating example of the capabilities and also the limitations of aircraft in such circumstances. R.A.F. shore-based reconnaissance aircraft first discovered the Bismarck and the cruiser Prinz Eugen at Bergen on May 20; on the following day a naval aircraft reported that they had sailed. Their whereabouts at sea, however, could not be discovered as the ships had probably taken the precaution of going far to the northward out of the range of our shore-based aircraft at home or in Iceland. The enemy had disappeared "into the blue."

Not until two days later were they discovered in the Denmark Strait in the evening by two cruisers which successfully shadowed them during the night. The hunt was on and early the next morning the Bismarck was engaged by the battle-cruiser Hood, which was sunk. An uneventful day's chase followed except for a minor brush with the Prince of Wales late in the evening. During that night, however, aircraft made their first appearance when torpedo machines from the carrier Victorious attacked the Bismarck from a considerable distance. They scored one hit, but apparently this did little damage and had no effect on the enemy's speed; at about 3 a.m. the cruisers lost touch owing to low visibility.

In spite of the carrier Victorious, with almost equal speed, being in the vicinity, touch was not regained until thirty-one hours later, at 10.30 a.m. on the fourth day, in a position about 550 miles west of Land's End by an R.A.F. shore-based Catalina flying boat. After half-an-hour's shadowing this machine lost touch. The position, however, had been reported and about a quarter-of-an-hour later aircraft from the Ark Royal, from Gibraltar, sighted the enemy. Her position then, however, was such that it was impossible for our battleships to intercept her before she reached Brest.

During the afternoon torpedo aircraft from the Ark Royal set out to attack but could not locate the Bismarck in the haze. Later the Ark Royal flew off more torpedo aircraft which this time made a successful attack, scoring two hits, one amidships and the other on the starboard quarter, which apparently disabled her rudders and partly wrecked her propellers. The Bismarck's speed was reduced and she made two complete circles, as if out of control.

Still the ship remained game until the middle of the night when, during a destroyer attack, two more torpedo hits were scored and an hour afterwards the ship appeared to be stopped. Later she was reported under way again but at a reduced speed of about eight knots. British battleships disabled her by gunfire and finally she was sunk by torpedoes from a cruiser.

By these operations the seal was set on the value of the torpedo rather than the bomb as the most effective aircraft weapon for inflicting crippling damage on a capital ship; it was the Ark Royal's aircraft torpedo hits that caused the initial reduction of speed which made possible our battleships' encounter. But here again some of the aircraft torpedo attacks

could not be carried out because of the inability to find the target, and others were unsuccessful even when the ship was sighted.

INSHORE OPERATIONS.

On the day the Bismarck was sunk the withdrawal from Crete began, that of Greece having already been concluded. These withdrawals, however, were in marked contrast to those from Norway and the French coast, where air cover was provided, inasmuch as the only air protection to the troops embarking and on passage to Egypt was that which could be provided by the A.A. guns of warships.

The withdrawal from Greece began on April 24, and continued for a week, during which 45,000 Army and R.A.F. personnel were brought away with the loss of no more than two destroyers and four transports, of which only one had troops on board when she was sunk. An Australian officer is reported to have said: "The Navy did an unbelievable job unbelievably well," and the Commander-in-Chief in his report remarked: "The determined way in which ships" (which included the merchant ships) "fought back against the aircraft attacks with their defensive armament was magnificent."

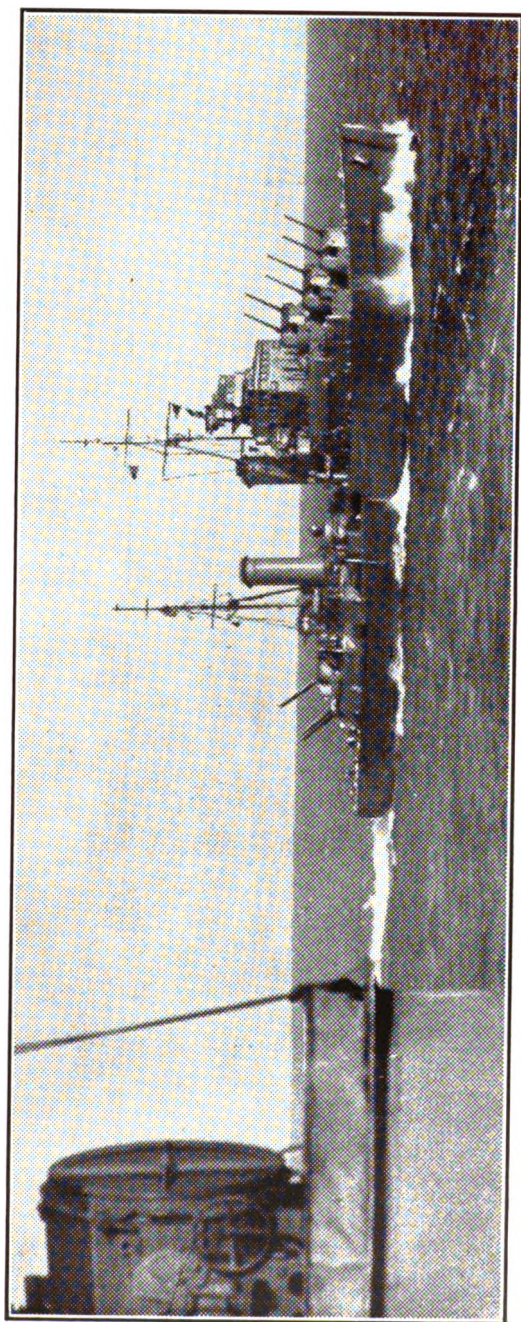
The Germans began their attack on Crete on May 19. British fighter aircraft had been withdrawn the day before the air invasion began so that the Navy operating to the north of the island to prevent a seaborne invasion, and later elsewhere to effect the withdrawal, had again to rely solely on the A.A. fire from the ships for defence against bombing attacks.

Early on May 21 the destroyer Juno was hit by a stick of bombs and sank immediately, but other ships present were undamaged. Next day cruisers and destroyers which dispersed the second German convoy attempting the sea invasion, as related by an officer who was on board one of the cruisers, were for two hours in the morning continuously attacked by high and low bombing. One hundred and eighty-six misses were counted round the ship, as she dodged the falling bombs at a speed of over 30 knots. The rate of fire from the four cruisers and three destroyers was tremendous and during this phase appears to have saved the hard-pressed light craft.

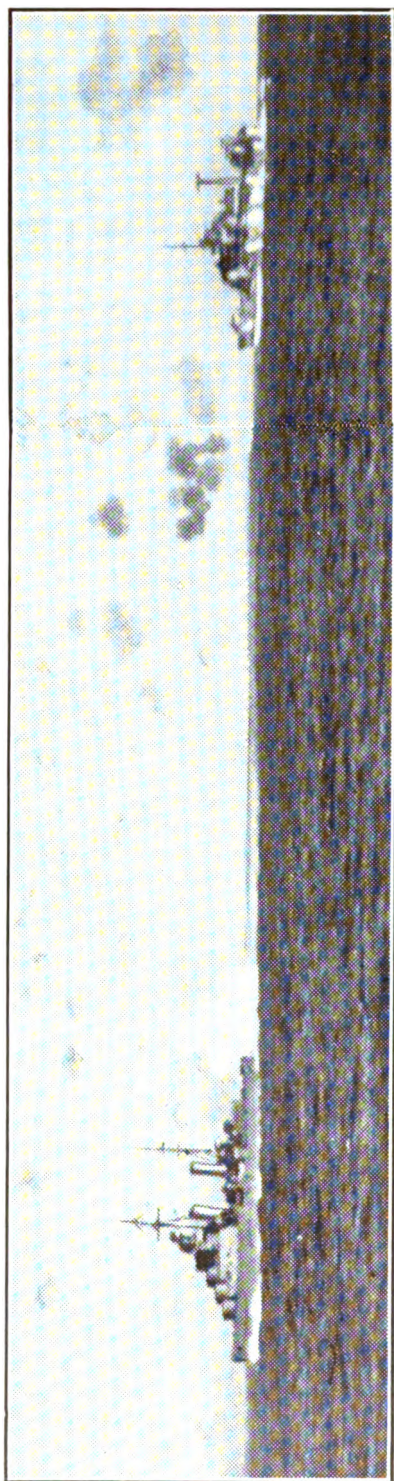
In the afternoon the destroyer Greyhound got astern and was sunk by concentrated dive-bombing. Two destroyers were sent back to pick up survivors and two cruisers, Gloucester and Fiji, lent A.A. support. The Gloucester received direct hits and sank, and soon afterwards the Fiji, trying to stave off repeated attacks, was likewise sunk. Two other destroyers, Kelly and Kashmir, were dive-bombed and sunk the next day, after bombarding Maleme aerodrome and searching for survivors from the Fiji.

The withdrawal from Crete began on May 27, and during the six days just over 17,000 men were taken off by night. The 360-mile sea voyage to Egypt had to be made during the whole fourteen hours of daylight, and the anti-aircraft cruiser Calcutta and two destroyers were lost.

The total warship losses by air attack during the five weeks between the beginning of the Greek withdrawal and the conclusion of that of Crete was nine—three cruisers and six destroyers. The greater number of ships, however, two cruisers and three destroyers, were lost not in the withdrawal but in repelling the sea-borne invasion of Crete and rendering other support to the Army ashore there. This was a heavy price to pay



A British cruiser prepared for air attack.



Convoy protection in the Mediterranean. British cruiser protecting merchant ship by A.A. fire.
(British Official photograph.)

for a mere delaying action which was already being nullified by air-borne invasion.

These inshore operations showed that, whereas ships at sea with freedom to manœuvre at high speed may be able to counter small-scale air attack with A.A. gunfire alone—as did the cruiser force in the North Sea early in the war—in the case of large-scale and heavy attack in restricted waters something more was required ; and this must be fighter aircraft, otherwise losses of ships would be comparatively high.

THE PACIFIC.

The foregoing review of sea-air operations was almost completed before the American and British disasters occurred in the Pacific, early in December. With the advantage of surprise before a declaration of war, the Japanese attacked Pearl Harbour with between 150 and 300 bomb and torpedo aircraft from carriers, repeating the British plan at Taranto. The loss of one battleship blown up by a magazine explosion ; one ex-battleship target ship sunk and another battleship capsized ; three destroyers and a minelayer also sunk and other ships damaged, was a heavy price to pay for a failure to be on the alert.

Three days later (December 10) the greatest aircraft success against warships was made when the new British battleship *Prince of Wales* and the old battle-cruiser *Repulse* were sunk by torpedo aircraft. These two ships, in the words of the Prime Minister, were sent to the Pacific “to form a spear point of the considerable battle forces which we felt ourselves at length able to form in the Indian Ocean.” No aircraft carrier could be sent with them because at the time, except for the carrier with the Home Fleet, all the available carriers were under repair.

The loss of these ships was incurred in what the Prime Minister described as “a thoroughly sound, well-considered offensive operation, not indeed free from risk, but not any different from many similar operations we have repeatedly carried out in the North Sea and in the Mediterranean.” It was, in his words, “to attack the Japanese transports and landing-craft which were disembarking the invaders of Siam and Malaya at the Kra Isthmus or thereabouts,” and Admiral Sir Tom Phillips in a signal stated “We hope to surprise enemy transports . . . and expect to meet the Japanese battleship *Kongo*.”

The ships had sailed from Singapore with their destroyer escort on the previous day with the object of attacking in the morning. Aircraft support from shore bases was not provided, but “the Admiral proceeded on the basis that clouds which were very low afforded effective protection for the offensive stroke that was made,” once more to quote the Prime Minister. As darkness approached, however, a Japanese reconnaissance aircraft was sighted and, as surprise was no longer possible, after dark the ships turned back for Singapore. At about 11 a.m. two simultaneous attacks were made on them, one by aircraft at about 5,000 feet, which were engaged by A.A. fire, and the other a high bombing attack from about 15,000 feet. “There were two high-level attacks, both of which scored hits, and three waves of torpedo aircraft of nine in each wave which struck each of our ships with several torpedoes. . . . The continued waves of attack achieved their purpose, and both ships capsized and sank, having destroyed seven of the attacking aircraft,” to quote the Prime Minister. A Singapore official announcement, December 11,

stated that " Within one hour of news of the attack reaching an aerodrome about 160 miles distant our fighters were on the scene, but by that time the enemy aeroplanes had withdrawn."

As regards the weapons used the Prime Minister remarked : " There is no reason to suppose that any new weapons or explosives were employed or any bombs or torpedoes of exceptional size." The explanation was that the attacks were made in such strength that, encountering no opposition in the air, these were sufficient to achieve the sinking even of one of our newest and therefore presumably best protected battleships.

That battleships were vulnerable to such repeated attacks was known and also that the only effective defence against them would be fighter aircraft. The result of this action underlined the lesson of Crete—that in areas where the enemy were able to concentrate large air forces, particularly from shore bases, warships could not operate without fighter support except at a heavy cost. But whereas in Crete bombs caused the sinkings, in the Pacific the torpedo was again the most effective weapon.

The loss to the Japanese of the old battleship *Haruna* on the same day, and damage to another on the next day, in air raids by American Army bombers showed that aircraft was a weapon which both sides could use with effect and did something to offset the loss of the *Repulse*, as the two ships were about the same age—twenty-five years.

GERMAN WARSHIPS ESCAPE.

The passage of the German warships, *Scharnhorst*, *Gneisenau* and *Prinz Eugen*, well screened by destroyers, E-boats and aircraft, from Brest up the English Channel to Germany on February 12, 1942, provided an illuminating example of the successful defence of warships against mass air attacks, as well as torpedo attacks from motor torpedo boats and destroyers.

About 600 British aircraft were concerned in the action against these ships, between 200 and 300 bombers and Coastal Command torpedo aircraft and between 300 and 400 fighters ; six Fleet Air Arm *Swordfish* also made torpedo attacks. The latter, though intended to be merely a reinforcement, were actually the first striking force to attack, and it was considered that they scored one certain and two possible hits with torpedoes ; but they lost touch with their fighter escort and all six were shot down.

The German ships were covered by an umbrella of hundreds of shore-based fighters, against which our fighters were pitted, and our 200 to 300 bombers had little success. Fifteen enemy fighters were destroyed by our fighter escorts and at least three more by the bombers themselves, but we lost 20 bombers and 16 fighters which, with the six *Swordfish*, made a total of 42 aircraft destroyed.

This action was not so much a ship versus aircraft engagement as an aircraft versus aircraft affair and proved, though proof was unnecessary, that ships adequately protected by shore-based aircraft could, at least, make a dash through narrow waters close to an enemy's aerodromes with little more risk than from other sea hazards. In fact the German aircraft umbrella also provided additional protection against the attacks of British destroyers and M.T.Bs. which attempted to torpedo the three ships.

SUMMING UP.

Some idea of the success achieved by men-of-war and merchant ships against German and Italian aircraft in the two years and four months of the war up to the end of 1941 may be gained from the following figures given by the First Lord of the Admiralty in Parliament on February 4, 1942 :

Aircraft.	By H.M. Ships.	By Merchant Ships.	By Naval Aircraft.
Destroyed	405	94	143
Probably destroyed	176	42	22
Damaged	239	96	95

The Fleet Air Arm, since the beginning of the war, had made 120 attacks on warships and convoys at sea, 200 attacks on warships and ships in harbour, 260 raids on shore objectives, and had fought 600 air fights. They had shot down, or damaged, 260 enemy aircraft over the sea ; they had sunk or seriously damaged 45 enemy warships of all kinds, and 385,000 tons of enemy shipping.

The results of two-and-a-half years of enemy aircraft attack on British warships may be summed up as follows :

1. *Home Waters*.—The Germans have failed to achieve the success they expected, and either the Fleet's resources in ship-borne aircraft and A.A. guns, or shore-based aircraft of the R.A.F., have proved sufficient to counter aircraft attacks.

2. *Mediterranean*.—The Italians have also failed to achieve success, in spite of the nearness of their aerodromes in some operations, and again the Fleet's resources have countered and prevented successful attacks. There was, however, one exception, though this was a German effort—the *Luftwaffe* dive-bombing attack on the *Illustrious* and *Southampton* in January, 1941 ; but apparently the cost did not encourage a repetition. R.A.F. aircraft have also defeated enemy air attack on ships.

3. *Combined Operations*.—In Norway, withdrawal of troops by sea was successfully carried out with few ship losses despite little air support from other than naval aircraft. At Dunkirk and elsewhere on the French coast, withdrawal was only possible with R.A.F. support, and even then certain ships were sunk and several damaged ; but this was largely owing to the R.A.F.'s limited number of aircraft at the time and other demands on them. Off Crete, where no air umbrella was possible either from shore bases or carriers, the loss of ships, including those sunk in repelling attempts at sea-borne invasion, was more serious.

4. *Pacific*.—The sinking of the *Prince of Wales* and *Repulse* was attributable to the absence of shore-based aircraft, a carrier, or even anti-aircraft ships.

5. *Harbours*.—British and German warships in harbour have suffered comparatively little damage from aircraft attack. On the other hand Italian ships at Taranto and American ships at Pearl Harbour were sunk and seriously damaged. The latter were admittedly "not on the alert" ; it seems probable that the same cause operated at Taranto.

6. *Weapon*.—The torpedo has achieved greater success than the bomb, and torpedo hits have enabled retreating ships to be overtaken and attacked by ships which could not otherwise have caught them up. But it is seldom possible successfully to use the torpedo against ships in harbour—except by surprise.

The deductions to be made from these results are :

1. Against massed air attacks, particularly with torpedoes, without

air protection ships are likely to suffer heavy damage and even the latest class of capital ship to be sunk. Even with carrier-borne aircraft available, although these will reduce the chances of enemy air success, shore-based aircraft are likely to have the advantage and score hits.

2. Against the attacks experienced from the Germans in the North Sea and from the Italians in the Mediterranean, ship-borne aircraft and A.A. gunfire alone has been sufficient to counter and even defeat aircraft attack.

3. *Harbour Defence.*—It is possible with adequate A.A. defences to reduce the number of bomb hits on warships to the minimum and so to berth ships as to prevent hits with torpedoes.

4. *Inshore Operations.*—Subject to taking into consideration the other risks, such as submarines, mines, surface ships and shore batteries, ships can operate in inshore waters within range of enemy aircraft, provided they have adequate air support.

5. The torpedo has proved more effective than the bomb in sinking ships, because it causes underwater instead of abovewater damage. But results depend on the position of the explosion; in some places the ship is crippled whereas in others little damage is done; though this factor applies to all weapons, shell, bomb or torpedo. The Fleet Air Arm's development, before the war, of torpedo tactics has been fully justified, for in this respect we have had the advantage of both the Germans and Italians; the Japanese successes have been mainly against targets taken by surprise or without aircraft defence.

The conclusions to be drawn are :

1. To ensure the highest degree of immunity from aircraft attack on ships, fighter aircraft are necessary as an integral part of a fleet; where possible, the larger shore-based aircraft are also desirable.

2. Failing aircraft protection, a screen of anti-aircraft ships, by increasing the volume of the A.A. barrage, may well reduce the chance of aircraft successes.

3. Ships A.A. armament provides a good measure of defence for all except heavy and sustained attacks, and a well-defended ship still remains one of the least attractive targets for aircraft attack.

* * * * *

Despite the air menace, which has proved to be less in practice than the pre-war threat of it, the British Navy continues to use the high seas with impunity, the through Mediterranean route when necessary, and even pass convoys up and down the East Coast, and to and fro in the Straits of Dover. It has also conducted successful inshore operations in support of the Army with losses not incommensurate with the results.

The question of how far ships can take the risk of exposure to air attack, as with other risks, depends on the issues at stake and the resources available. The Prime Minister has said :

"I cannot, however, give any undertaking that occasions may not arise when ships may have to engage without having carrier support or being so close to the land that they can have effective shore-based air support. That is a matter which has to be judged on the spot by the responsible officers."

One thing is certain above all others, and that is that no Navy can win a war, or campaign, by remaining in harbour. To go to sea has always meant taking risks, to which the risk of aircraft attack has now been added. But this new method of attack has its counters and anti-

dotes and can be defeated with the use of the right weapons and tactics—the most important of which are fighter aircraft.

Taking the large-scale view of two-and-a-half years of war, air power has proved more of an asset to sea power than a counter to it. In fact, despite the general idea to the contrary—it is a failing of the British public to remember enemy successes and forget our own—the British Navy has, first, countered or defeated more aircraft attacks than have been successful and, secondly, has scored more successes with aircraft than the three Axis Powers combined—despite the fact that it has had far fewer targets to attack.

Nothing in this war has justified the argument that the battleship has been rendered obsolete by the advent of aircraft or that aircraft can replace any type of warship or perform its tasks. Like the submarine it can attack the enemy in conditions where ships cannot, and for this and other reasons the aircraft is a valuable and essential integral part of any modern Navy. But like all other forms of war machine it has its limitations and its antidotes, which if used correctly will defeat this latest of machines in sea warfare.

It is the old problem of a new menace requiring a new antidote. Shells which shattered wooden hulls caused the production of armour; torpedo boats produced the destroyer as the reply. In the 1914–18 war the submarine became such a danger that the Fleet at sea required an effective anti-submarine screen of destroyers. The correct counter to aircraft attack on ships, as on any other target, is fighter aircraft.

The main lesson of the war at sea, as regards aircraft attack against ships is that, given adequate protection, the bomber and torpedo bomber can be defeated. But even the most modern capital ships with all their armour and gun-power, if left “naked,” will suffer the same fate as an unarmoured ship from shell fire and the unscreened vessel from submarine attack. The capital ship must be free to perform her true functions of engaging capital ships—or smaller fry—but other forms of attack below, on, and above the sea must be countered by the correct antidotes. The battleship will then remain, what she has always been, mistress of the seas.

H. PURSEY,
Commander, R.N.

CHAPTER VII.

SEA POWER IN THE EASTERN WAR.*

THE naval problems of the vast waters washing the eastern and southern shores of the Old World differ so radically from those of Europe, both as regards strategy and material, that an understanding of the distinctions appears to be a matter of no small consequence to the future of democratic sea power and of the peoples dependent thereon. Since the days of Hughes and Suffren there has been little occasion to discuss the question of sea power in the Indian Ocean, whereas the matter of Pacific strategy has been generally limited to a "blue water" examination of fleet strengths and logistics. Under present conditions the non-existence of an anti-democratic navy in the former waterway would seem to suggest that there can be no valid presentation of an Indian Ocean strategy other than an admission of the value of Mauritius, Aden, and Trincomali, a tabulation of distances and a survey of the problems involved in running down commerce raiders. Hypotheses involving an Axis seizure of the Mediterranean, Red Sea, and the shores of the Gulf of Aden would produce one strategic picture of the Indian Ocean, whereas an equally hypothetical Japanese seizure of Malaya, Borneo, and Sumatra would create an entirely different picture. Similarly, with regard to the Pacific, the strategic outlook of the United States would vary widely with the enemy or potential enemy contemplated and the location of bases. The availability of Singapore to American naval forces, for instance, has profoundly affected a strategy whose cornerstone was an unmodernised Manila, and had the Philippines and Guam remained under the control of Madrid, the type of strategy accepted by Washington might long have been diametrically the opposite of what it is to-day. This kaleidoscope of strategies could, of course, be continued almost *ad infinitum* by leaving Germany in control of its former Pacific Islands with strong squadrons and numerous submarines and other raiders based upon an impregnable Truk Island, and so forth.

The above strategies, however, besides being purely regional, derive almost completely from standards that have been based upon experience in other waters, especially those about Europe. They are the result of the application of empiric rules to a sphere where hypothesis and synthesis must of necessity rule. The suggestion that, barring the question of logistics, the effectiveness of sea power in one body of water may differ greatly from that in another may seem entirely unwarranted; but this paradox will be dispelled when attention is transferred from the ship to the functions it has been called upon to fulfil, the characteristics of the areas wherein the functions were performed, and the special conditions attaching to these areas. If it be found that these functions have been peculiarly European, it would follow that other functions may be performed in such waters as the Indian and Pacific Oceans, and that existing naval material may accomplish in the east what it cannot effect in the west.

A study of the development of sea power in the Mediterranean and the North Atlantic actually disclosed the fact that it has for centuries

* This chapter, by a well-known American writer on strategy, was written before the Japanese attacks and subsequent declaration of war in December 1941.

been seriously limited by essentially European conditions which, strangely enough, have been non-naval in character. While the dominant element in European waters has been British sea power, this has been the weapon of a peaceful people not given to the construction and employment of elaborate arms of aggression. It is a truth insufficiently realised that the offensive weapons of war, both naval and military, have been the conception or improvement of militaristic continental powers and not of the naval democracies, as clearly evidenced in the case of the shell-gun and the iron-clad. Had Britons been militaristically inclined they would unquestionably have produced warships of such size and power as would have enabled them to attack the coastline of Europe and land conscripted armies thereon, improving this naval ability to conform with military progress ashore. Such vessels could naturally have performed many functions now deemed impossible or impractical in any sea. But from the fact that fighting ships of this type were not laid down in British shipyards, it does not necessarily follow that the fleets actually launched cannot perform many truly offensive functions in waters less militarised than are those of Europe and where aggressive land powers have not as yet planned the destruction of their sea-going rivals. A contributing factor to this European circumstance has been the ability of British diplomacy to obtain continental allies whose ports afforded the Royal Navy those bases which, under an offensive system of naval war, must have been seized by force. Here again, Great Britain found it impossible to negotiate these alliances, the attention of the British people and of the Admiralty cannot but have been focused upon the bringing about of radical changes in floating material. And it might be borne in mind that the necessity of coalitions arise from the great discrepancy in numbers between the population of the British Isles and that of the continent, a distinctly European factor. The controlling element influencing the growth of modern British sea power has been the physically obvious though functionally hidden fact that the Royal Navy has been uniformly successful in its efforts on the high seas, and that its allies, assisted by British expeditionary forces, were equally fortunate on land. As a result it did not become necessary to ask what sea power could do under conditions other than those that had prevailed for centuries, nor to speculate as to what must have been done had the victorious alliances been in fact defeated. From a naval standpoint it would seem that the secret of these alliances was not so much the fact that they provided bases for the British Navy, but that, prior to the present conflict, the friendly land powers had been generally able to protect the anchorages. The assumption, prevalent if not clearly expressed, arose that there would always be such havens, with the corollary that no attention need be devoted to the problem of creating them by the use of sea power. Thus naval theory, and through it naval material, drifted imperceptibly away from contact with the land and concentrated its attention upon the high seas. The cardinal rules of naval warfare are hence seen to be European in derivation and application.

The above circumstances, however, exist to but a very limited degree in Afro-Asiatic waters. Along the immense stretch of coastline between the Union of South Africa and China there is not a state that could guarantee Britain or the United States the use of its ports against the assault of a powerful enemy that had reached its inland boundaries, and the alignment of Japan with the anti-democratic forces stresses this condition with respect to the shores still farther to the north. The

consequence has been that important formations of Imperial troops have had to be detached from a possible decisive battlefield in Europe in order to safeguard the approaches to the Indo-Pacific—to Egypt, the Near and Middle East, to India and to Malaya; not, as in the past, to garrison islands and strips of coast that could only be reached by sea, but to bear the brunt of the overland attack of forces that were strongly entrenched in the hinterland, including Europe itself. One can but speculate as to what might have occurred had Berlin directed the full force of the *Luftwaffe* against the Mediterranean instead of against the Soviet Union, thereby possibly enabling itself to transfer imposing armaments first to Alexandria and thence into Asia and Africa. To the relative weak military position of the territories abutting upon the Indo-Pacific must be added their low industrial capacity, particularly as regards the production of the countless items required for the conduct of modern war. This deficiency produces a dilemma, in that vast quantities of materials must either be shipped to this region by sea or produced locally under the protection of large defensive establishments, for the support of which the local economies cannot for many decades hope to become responsible, and the usefulness of which on a European or near-European front would be of infinitely greater military importance. The most significant distinction between European and Afro-Asiatic alliances lies in the fact that the former, because they would generally assist in the conflict with the principal enemy, are decisive and offensive in nature, whereas the latter would be almost completely passive and defensive. The successful defence of a France or a Russia could bring in its train the defeat of a Germany, but such a result does not necessarily flow from successful resistance to a Germany in Kenya or Iran.

In addition to the element of military weakness displayed by the lands of the Indo-Pacific front as compared with the strong alliances Great Britain has usually been able to find in the west, account must be taken of further differences in the matter of land strategy, and the effect of that difference upon sea power. The relatively short fronts in Europe have, if anything, favoured the defence, so much so that the carefully worked-out plans of Napoleonic France and Imperial Germany were brought to nought, and Nazi Germany was compelled to resort to radical instruments and tactics to compensate for the strategic shortcomings inherent in any short front. But once an enemy has penetrated Africa, Asia, or both continents, the land front fans out so extensively and rapidly as to place an immeasurable strain upon the defence, inasmuch as the possible points of attack become greatly multiplied and the probabilities are thereby enhanced of an enemy being able to force through a passage to the coasts. It is doubtful whether any theory could be more fatal than that which propounded a static defence of the front Suez—Herat. This consideration would still remain valid, however greatly augmented and industrialised the native states of the East might wax in future decades and centuries.

A final important disadvantage to the democracies in this region, and one not hitherto experienced in Europe's wars, has been the adherence of Japan to the Axis group, the alliance between the hereditary enemy of democratic sea power, the European militaristic state, and a strong naval and land power in the Far East, which has denied to the democracies the naval use of Asiatic continental ports between the Siberian border and Saigon. It has been a cardinal principle of British strategy, usually imposed by circumstances, to outflank an enemy in Europe, as illustrated

in the case of the simultaneous advances upon Napoleonic France through the Lowlands and the Peninsula, and the policy of protective encirclement subsequently adopted against Germany. The strong tendency of the anti-democratic forces, however, has been to reverse the process and attempt to outflank Great Britain, and more recently the United States, in Afro-Asia, indicated in the west by the episode of the Berlin-Baghdad railway, the German-Turkish Alliance of 1914, the Italian seizure of Ethiopia, the Nazi-Fascist campaigns in Libya and their intrigues in Iraq, Iran, and Afghanistan, German pressure upon Turkey and its threats to the Indian Ocean *via* the latter country and the Caucasus, and, in the east, by Japan's appropriation of the mandated islands in the Pacific, its absorption of Manchuria, and the undeclared war against China, the "protective custody" afforded French Indo-China, the steps taken to include Thailand within its sphere, the seizure of countless islets in the South China Sea, and Tokyo's manœuvres in the direction of Burma, Malaya, and the Philippines.

But if the above clearly non-European types of conditions work to the disadvantage of the democratic sea powers, the latter appear to be considerably favoured by still other circumstances in that, contrary to possibilities on the traditional European front, they facilitate the conduct of offensive enterprises, largely naval, with existing material. While sea power in Europe remained non-aggressive, the phenomena of that continent enabled land and air power to acquire an unusual ascendancy over the naval weapon. Europe's industrial population exceeds that of any other land area, its surface is criss-crossed with a maze of railroads and automobile highways, all constructed with a keen eye to military requirements. This continent, largely free from military geographic obstacles, particularly along its coastline, is dotted with countless manufacturing plants, a great number turning out munitions of war, and with many engaged in the production of synthetics that have to no small extent circumvented the British blockade. Distances here are small and nearly every mile of shoreline can be readily reached by military forces allocated to a comparatively few reserve areas. Airfields are plentiful and the majority of ports well defended by heavy artillery, extensive minefields covered by batteries, and torpedo-firing equipment. Against such shores a naval power that was never aggressive in the political sense and which had been shorn of its principal inherent powers by the democratic but catastrophic naval limitations treaties, cannot very well hope to contend. Land-dominated narrows preclude democratic naval penetration of the Baltic and Black Seas, and ventures into the Adriatic and Aegean would normally prove costly, while the attitude of Spain casts a shadow over the Strait of Gibraltar. Such disabilities, however, do not apply to the territories bordering the Indo-Pacific with the exception of the main Japanese islands only.

The same military weaknesses that render it difficult for these eastern lands to defend their rear and flanks against European militaristic invaders, by a like token deny such an aggressor the use of such material military and associated establishments as exist in Europe which, sooner or later, lend their equipment and productive facilities to the cause of a successful conqueror. Without the preliminary of dynamite or the torch, vast regions of Asia and Africa belong militarily to a "scorched earth" classification. In place of the intricate network of well equipped, high-capacity railroads of Europe there are but the widely separated limited-

capacity tracks of Egypt, the solitary line to the Persian Gulf, the Trans-Indian that could be blocked for a considerable period by the destruction of a number of its many rock-hewn tunnels, the isolated rail system of India, the coastal road of Indo-China, the few, widely separated lines of China and the terminal spurs of the Trans-Siberian. Branch lines, so valuable for reroutings, and the material from which may be used elsewhere for the reconstruction of shelled or bombed main lines, are almost totally lacking. Good automobile highways are conspicuous by their absence as is the continuity of even fair roadways. Whereas, in Europe, the mere reaching of a coastline is now synonymous with its effective defence against naval retaliation, however promptly applied, the invader who thrusts his spearheads to the shores of the Indian Ocean would find himself in a position analogous to that of a naval commander intending to seize Wilhelmshaven. The advance guard of such a land power would be suspended at the end of tenuous lines of communications trailing back a thousand miles or more across the military equivalent of a sea, to the nearest European bases. Along these entirely inadequate routes must come all reinforcements and every round of ammunition and item of equipment, nearly every variety of food and, except at the headwaters of the Red Sea and Persian Gulf, every barrel of fuel and, of course, through countries lacking in proper accommodations. On such coasts and in competition with land communications, the great carrying capacity of the cargo ship and transport, the symbols of maritime power, reigns supreme. Japan's success in her war against Russia in 1904-5 was an historic example, under the favourable conditions now prevailing in the Indo-Pacific area, of the triumph of the ship over the railroad, of unlimited water-borne cargoes over long, thin lines of land communications. The conclusion appears to be inescapable that in the region under examination the sea, not the land, is the dominating element of rapid and important concentrations, and concentration, in one form or another, is admittedly the secret of success in war.

The above maritime ascendancy suggests the requirement that naval force guarantee the full war use of cargo ship and transport; for, quite patently, in the absence of such a guarantee, ascendancy becomes a meaningless term. It would seem clear that if freighters can gain a superiority over the railroad, automobile highway and camel and mule track, that fighting ships should be able to obtain and hold for a reasonable length of time a similar superiority over a shore-based enemy who must rely upon deficient land routes for the means wherewith to combat a naval assault. The effective use of sea power in this connection would seem to be the bombardment of hostile "coast-heads" and the covering of landings upon nearby beaches whence the coast-head may be encircled and crushed. An invader assailed in this manner can but choose between massing his artillery at the coast-head and accepting the serious threats that unimpeded water highways can bring against his flanks and rear, or extend his batteries along so lengthy a front as to make them not only ineffective, but still susceptible of being outflanked and rolled back with relative ease. The operations of the Royal Navy against Narvik, Dunkirk, Libya, and Somaliland would indicate that this suggestion is but an application to less defensible areas of what was, in varied circumstances, a highly commendable display of naval power.

Such naval-maritime action could not be restricted to the assault of advance-guard coast-heads, for in due time the land-based enemy would

be able to construct intermediate bases which would gradually overcome the ascendancy now possessed by sea power. Important expeditionary forces would have to be launched both against hostile communications and against the main invading armies which would then be confronted with the dilemma previously discovered by the advance guard. The standard procedure of land power in Europe has been to obtain control of enemy coasts on the continent either by advancing upon them from a central position, as in Napoleon's campaigns, or by a process of what might be termed "coast-creeping," i.e. sending columns along the coast in order to deny its use to the enemy. The German seizure of the ports of Norway before having obtained control of the interior of that country, the dash along the northern and western coasts of France while that nation's armies were still in being to the rear, and the Nazi coastal move in the Baltic States plainly disclose the anxiety displayed by modern land power to close enemy harbours to sea-borne assistance. In existing conditions, as previously observed, the success of naval assaults upon European shores cannot but be extremely doubtful, and even were a beach-head secured, the expedition that would be landed must be extremely powerful because of the concentrations it would face upon the front and flanks. Consequently operations against German occupied Europe were frowned upon by the democratic naval and military staffs, and great reliance has of necessity been reposed in the warplane. But the attempt of an invader to coast-creep in Asia and Africa would be an extremely hazardous undertaking against an active defender. Such sections of Europe's coasts as do not come within the arc of fire of the numerous coastal fortresses can be defended by concentrations of mobile coast artillery held in reserve for that purpose at strategic locations and these, in turn, can call upon the field artillery depots for further support. Except at a few points the Afro-Asiatic coast boasts neither guns, depots from which they can be drawn, nor communication systems over which they may be effectively transported. Enemy forces "creeping" along the shores of the Indo-Pacific must bring their own ordnance, and the quantities required to rival the security of a European coastline staggers the imagination. One need but imagine the problems of security presented to an invader endeavouring to hold a position on one or both coasts of the Red Sea or Persian Gulf, the reaches of East Africa or southern Arabia as well as the shores of Iran and India. The position of Japan represents such an attempt in both its incipient and advanced stages, and will be examined later in detail. From whatever angle considered, however, a coast-creeping enemy would be in a position appreciably inferior to that of the advance guard already discussed, for his entire communications would be open to naval and maritime interference. The destroyer is an ideal weapon for the attack of such operations, the heavy cruiser enjoys the benefits of a long-range weapon, while the capital ship carries an armament superior to anything an invader can move along the Afro-Asiatic coasts in significant numbers, and protection sufficient to withstand the calibers of shell normally to be expected. Similar considerations, though to a somewhat less extent, apply to an invading air force which would, in a number of these areas, have to contend with trying weather conditions. The fields serving these aircraft would frequently be subject to maritime operations and to the attack of carrier planes whose bases could be shifted and drawn out of normal range as suited prevailing circumstances. The configuration of many sections of these coasts, including the offshore islands, confer upon

the defenders an ability to work out effective combinations of land and carrier-based aircraft operations besides greatly increasing the range in that aircraft suitable for carrier landings could function from alternate shore and floating bases. Sea power in the Indo-Pacific cannot naturally be expected to do more than establish coast-heads, deny them to an enemy, dislocate attainable hostile communications and harass an invader during periods that should be sufficient for the maritime-borne land and aerial forces to finish the task. As fighting ships cannot be expected to contend with the traditionally greater strength of concentrated land power, so must its associated aircraft not be held duty-bound to contend with the full strength of a land power's air arm. Naval functions of the kind under consideration are essentially advance-guard activities, though of an extremely valuable if not vital nature, and cannot be expected to perform against the main body of an enemy force what is not expected of a powerful advance guard on land.

The latter observation is particularly applicable to naval-maritime activities directed against an enemy employing a central type of strategy as distinguished from that of coast-creeping, i.e. moving inland and dispatching his columns towards a limited number of coastal points. To counter such moves sea power confers upon the defensive forces the ability to act from a great number of alternate maritime bases in such strength as the particular action warrants, with the knowledge that retirements can be effected in a number of directions, and that moves that might be unwarranted in an all-land campaign could be attempted in the circumstances indigenous to the East. Particularly effective might be the systematic employment of strong raiding parties launched against hostile communications, an unusual but seemingly justifiable extension of the theory of the naval blockade to the land. Sea power enjoys an inherent ability to multiply raiding and feinting operations of a kind certain to entail great wear and tear upon the opposing land power. The synchronising of naval-maritime moves with democratic offensives emanating from land areas in this region would obviously be an ideal use of sea power, particularly where the respective fronts were separated by such distances as would compel an enemy to submit his command to serious dispersal. In view of the incalculable value of beach-heads, of the necessity of preventing an enemy from establishing their counterparts, and because of the projects than can be achieved by the joint action of land and sea based units, special attention it is believed should be devoted to these aspects of naval strength. While coastal fortified positions are usually constructed with a view to naval assault alone, it would appear that this has involved too restricted an appreciation of their significance. With respect to the East in particular, the time might not be wasted that is spent in re-examining present and selecting future base sites for more offensive purposes than those of refueling and repairs, with the attendant theory of passive resistance. As the centres of military strength of the democracies do not lie along the Indo-Pacific coasts but must, as occasion dictates, be brought thereto, it would seem that the seaports are quite as important a factor in their defensive scheme as are frontier fortresses. France fell, not when the Maginot Line was turned, but when her harbours passed into German hands. Inasmuch as naval and military depots must be maintained on the Afro-Asiatic littoral, the fortifying of a reasonably large area around each is a matter worthy of serious thought, particularly so since the weapons and tactics of the morrow may be even more rapid

and destructive in their action than are those of to-day. Such strengthenings always take place when danger looms, as demonstrated by the bolstering of the defences of Singapore, Hong Kong, and Manila, and should accordingly become the subject of a systematic inquiry.

The above considerations, while applicable in principle to the entire Indo-Pacific, were particularly stressed with respect to the region between South Africa and Malaya. In the western Pacific and adjacent seas the invasion possibilities deemed to be hypothetical in the Near and Middle East have actually been anticipated by Japan. The handicap of insufficient land communications associated with this entire region has been well brought out by the manner in which Tokyo was compelled to abandon what would have been a sound though expensive venture of coast-creeping, in favour of naval-maritime expeditions against southern China and Indo-China, thus employing against China in particular that type of sea operation herein recommended. The position of the Japanese armies of occupation, however, is even less favourable than would be that of an Axis army invading the territories touching upon the Indian Ocean, in that they are depending almost entirely upon maritime communications to the south, which, though convenient, are open to attack by superior naval forces. The application of direct naval-maritime action is thereby rendered much more promising against Japan's isolated outposts than against an enemy based wholly upon land. On the other hand, the democratic problem has been complicated by the fact that whereas the course of action herein contemplated envisages prompt measures against hostile forces that had attained the coast, Japan has been sufficiently long established at Amoy, Swatow, Canton, and in Indo-China to have been able to construct permanent works. None the less, its principal reliance appears to have been placed in the naval defence on the theory that the existence of these outworks in China and Indo-China automatically converted the neighbouring waters into "narrow seas." Such a belief, however, does not seem to be correct, suggesting as it does, an unwarranted assumption of the European interpretation of the term "narrow seas," expressed or implied, to an area to which it is inapplicable. Chinese and Indo-Chinese ports and shores can no more be militarily compared with Hamburg, Calais, Cherbourg, and Brest than can the industrialisation and communications of the one be compared with the other; nor is there the slightest similarity between the limited military formations Tokyo has assigned to the occupied territories to the south and the war machine which Germany created in Europe. The Japanese warships that are or can be allocated to the South China Sea can constitute no such threat as would turn back a British or American fleet bound upon an important mission, and there is not as yet any evidence tending to emphasize the powers of the Japanese Air Force which, numerically at least, is by no stretch of the imagination the counterpart of the *Luftwaffe*, and which must regard with no little respect the strong, well-trained democratic groups containing a large number of the most modern warplanes that are stationed in this area, and the Soviet air armadas to the north. To approximate the position of the Axis powers in Europe it would be necessary for Tokyo to move down the Chinese and Indo-Chinese coast by land under cover of an overwhelming air strength, constructing on the way an elaborate railway and automobile system whereby powerful armies could be expeditiously carried from Korea to Saigon without interfering with lateral military and supply movements, the latter deriving from

factories Japan would also have to build in this region. But until such a time as south-eastern Asia becomes somewhat of a replica of Europe, such isolated sectors as Japan has seized must be looked upon as the virtual counterparts of the footholds that the hypothetical invaders had secured on the borders of the Indian Ocean, and under comparable conditions, treated accordingly. Because of their territories and friendships in this part of the world, the naval and maritime power of the British Empire, the United States, and associated states are particularly well placed and armed to resort to direct naval and related activities. In this part of the Indo-Pacific, Hong Kong will be recognised as the valuable type of fortified beach-head recommended for other sections of this coast-line. Before the Japanese descents upon China this British naval base held a position comparable to that of Aden or of Basra in that it was backed by an extensive buffer state as these Indian-Ocean-Persian Gulf ports are to-day, although at Basra Britain took the precaution to occupy the Iraqi hinterland whereas in the Far East the democracies permitted Japanese seizure of highly strategic points. But it should be remembered that these points are strategic only in a theoretical "European" naval sense. They can readily be cut off from Japan by the exercise of democratic sea power; as the fuelling stations of a numerically inferior navy they lose much of their theoretical significance, and by the democratic powers they should be regarded as points to be seized by direct or flanking operations, rather than as "narrow seas" ports to be avoided, since they do not harbour large hostile concentrations.

Farther to the north, along the shores between the continent opposite Taiwan and Vladivostok, the problems of eastern sea power approach, though they do not coincide with, those obtaining in European waters for the basic reason that, though Japan is geographically in the position of the British Isles with respect to the mainland, its Strait of Dover is not kept by a superior navy, and Japan's position with respect to Vladivostok is not enviable. The Pacific Asiatic seaboard presents the picture of an expanded Japanese Empire that is outflanked by Siberia in the north, by Burma in the south, from which latter direction democratic battalions could advance into a China whose friendship would remove many of the obstacles that have hampered Japanese coast-creeping. As, in circumstances permitting the use of sufficient British and American naval power in the Pacific, the Japanese Navy cannot hope to effect the issues to a significant degree, Tokyo must count heavily upon an air force which, as previously indicated, must be scattered between Vladivostok and Saigon, not to mention its insular outposts in the Pacific, because of the geographic, military, and political elements of an Asiatic front that differs so markedly from any that could be designed in Europe. Furthermore, as Japan's position in the South China Sea is strictly that of an advance guard, the seizure of each point would entail no operations into the hinterland, and leave the victors free to proceed with the next beach-head. The submarine menace could be largely reduced by effective bombing and shelling of their bases. In the final analysis, losses must always be expected in a military enterprise, and it is to be doubted whether an expedition sent across these waters from Singapore or Manila would suffer as heavily as would a land formation fighting its way over a China Sea that had been changed into dry land.

From a broad standpoint, three of the oceanic fronts of the Eastern Hemisphere present as many gradations of sea power, and as many

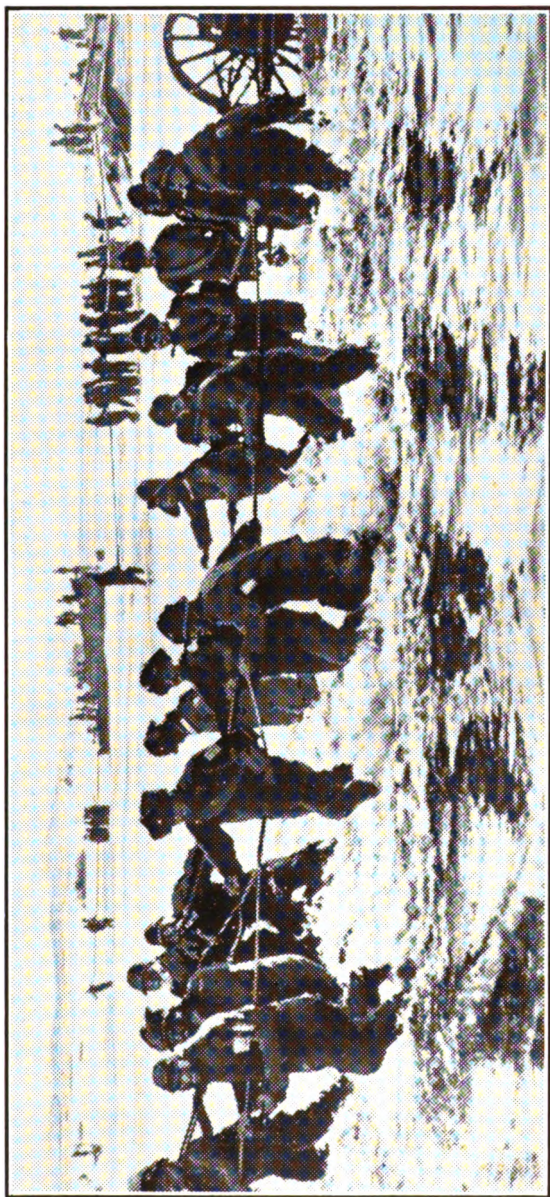
problems. On the European front land power and its attendant air weapon have secured an ascendancy over sea power that can only be eliminated by radical departures in warship design and displacement. On the Indo-Pacific front sea power still holds control, decidedly so in the Indian Ocean, and to what may be an unrealised degree in the Pacific and associated waterways. Far-sighted political, naval, and military planning appears to be in order as regards the Indian Ocean so that time and events may not be permitted to repeat on this front the occurrences of Europe. Similar considerations attach, and more urgently so, to the Western Pacific. But for Chinese resistance, democratic sea power in the Far East might already be in eclipse. As matters now stand, however, the Pacific still appears to offer considerable opportunities for that direct action of sea power against the land which is as yet unthinkable at the other extremity of this land mass.

It is especially because the Afro-Asiatic land mass is the rear and flank of what has for centuries been the European militaristic camp that the task of sea power in the Indo-Pacific is one of a paramount importance that cannot be relegated to any other arm. To an unprecedented extent the ports of this immense body of water are now being used to replenish the fighting fronts of the anti-Axis forces. British, American, and Allied supply ships and troop transports have been calling at such widely separated perimeter ports of the Indo-Pacific as Vladivostok and Hong Kong, Manila, Batavia, and Singapore, Rangoon, Basra and Suez. Lest some of these ports in the near future, and all of them at some more distant period share the fate of Bergen, Amsterdam, and Rouen, special Eastern rather than European theories require examination. The problem is much more than that of defending the territories and interests of the democracies in these regions. It is that of preventing the formation of a militaristic hegemony of the Eastern Hemisphere which cannot but extend its weapons throughout the world, either in this or in some future generation.

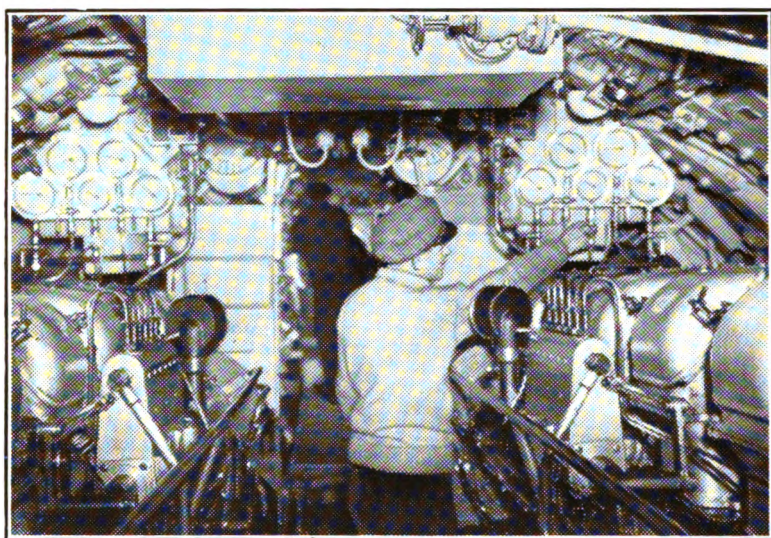
The above study is intended to be exploratory rather than dogmatic. Its prime purpose is to indicate the understandable influence of actual experience upon the instruments and theories of sea power in order to show that they have been regional rather than global, and that the peculiarities of the Indo-Pacific waterways call for separate examination and treatment lest opportunities of success be overlooked because of an adherence to doctrines that more properly pertain to Europe. It would seem to follow as a necessary corollary to this inquiry that future discussions relative to naval limitations can no longer be restricted to questions involving floating equipment. A vital objective of the democracies must be the safety of the Afro-Asiatic coastline, and this cannot be secured by the construction of types and numbers of ships proportioned to what might be agreeable to powers either possessing no interest in this basic factor or intending or hoping at some future time to expand into Africa and Asia. However approached, the problems and tasks of sea power can no longer be segregated from the general field of war power and of the requirements of self-preservation. A great sea power is logical even in a world that possesses no others because it is only by sea that the democracies can hope to prevent world conquest. Land power to-day and air power to-morrow can conceivably annex first the Old World and then the New. As the democracies do not want to annex the rest of the world in order to dispel the land peril, nor to suffer the attrition promised in future air wars, the

most economic alternative appears to be sea power, and sea power without access to the Indo-Pacific rear of the European militaristic camp would be of little value. That such a weapon would not be used aggressively has been amply demonstrated in recent history. Were this not true, Great Britain and the United States would long since have divided Asia between them.

ALEXANDER KIRALFY.



Japanese troops landing on an open beach.



Life in a British submarine. 1. The engine room.

(*'The Times'* photograph.)



Life in a British submarine. 2. The ward-room.

(*'The Times'* photograph.)

CHAPTER VIII

COMBINED OPERATIONS

THE close and effective collaboration of three independent services is a very complicated problem which calls for clear understanding of present conditions and a careful study of the past. Much progress has been made in some directions since war began, but it is difficult to say how much. These preliminary remarks are therefore confined mainly to the pre-war period.

DEFECTS IN 1939

Before 1940 we were working in the dark, guessing, and due to the lack of imagination of the average Englishman our preparation for war was far less efficient than most people supposed. As an Island Empire we were utterly dependent on the sea and on a Navy which could function effectively only if given the closest possible support and co-operation from adequate air forces. But the Coastal Command and the Fleet Air Arm were both much too small for the Navy's needs and many of their aircraft were old fashioned and obsolete. There was, in fact, no hope that the Navy could get the air support that it needed. Press and public had talked much of "Safety First," the desirability of defence, and the impropriety of making preparations for any kind of offence. In consequence the bulk of the R.A.F., with nearly all its newest aircraft, was concentrated on the task of the air defence of Great Britain. There was also a bomber striking force for the main purpose of making reprisal bombings against Germany, though this force did not begin to function effectively until after we had lost all the French aerodromes from which useful bombing could be carried out. There had been no demand either from Press or public for an increase in those air forces which were essential to the Army and Navy if they were to win battles on land and sea.

On the contrary, it had been made clear to those two Services that the R.A.F. would be engaged in a desperate struggle for command of the air with a superior enemy and in consequence could ill afford to make any reduction in the total strength that it devoted to aerial warfare. Our main strategy, in fact, far from aiming at real combined operations, was largely based on the old fallacy of "dog eat dog:" i.e. the Navy would search for and try to destroy the enemy's fleet, the Army would endeavour to defeat the enemy's army, and the Air Force would fight a separate battle for the command of the air. Training was naturally carried out on a similar basis and therefore if some desperate need had arisen, e.g. from an invasion of Britain, any additional air forces that had to be suddenly allocated for co-operation with the Army or Navy would have been totally untrained for the task.

The R.A.F., for a variety of reasons, had been educated to a very "isolationist" point of view, and while claiming, perhaps justly, that some Admirals and Generals were not sufficiently air-minded, they were so air-minded themselves that battles on land and sea became, to the Air Ministry, matters of secondary importance. The bulk of our efficient air strength was devoted either to fighters, for the defence of Britain, or to bombers for attacking Germany. It was a very plausible theory that

"The bomber will always get through: therefore we must have more bombers than the enemy so that however much he blasts our cities we can blast his a little more." Unfortunately, events have proved that, in 2½ years, this theory has not produced the results hoped for. (One might equally say that, in the open sea, "the submarine will always get through": but we could never win a sea war by just having more submarines than the enemy.) On the other hand, in the Far East, to take one example, the enemy, by using his three fighting services in close co-operation and bringing armies across the sea escorted by aircraft and warships, has won success after success.

On the other hand, on February 11, 1942, three large German warships left Brest, passed up Channel and through the Straits of Dover on February 12, in broad daylight, and arrived in German ports during the next night. Those ships had lain at Brest for nearly a year and had been bombed by the R.A.F. no less than 112 times. The last bombing was on the night they sailed, which was only four days before new moon. Six hundred British aircraft were used to attack them, as well as destroyers and motor torpedo boats, and the attacks were pressed home with the utmost gallantry. But no German ship was sunk or even stopped: they were last seen steering for their home ports at 18 to 20 knots.

Were those scanty results due to extreme efficiency of the German defence, or were they partly due to the fact that those 600 British aircraft had not had much experience or training to fit them for taking part in a battle at sea? We do not know. Some have asked "why did not the Navy stop those German ships?" The answer is that our ships allocated for that duty would necessarily have had to lie at the South coast ports of Sheerness, Portsmouth or Plymouth. But had the Admiralty ordered the ships there, they would have expected them to be blown to pieces or sunk by German air attacks in much less than six months. Had that occurred they would rightly have expected to be severely censured. It does seem therefore that the German method of co-ordinating all arms, under the direction of the Great General Staff, produces better results in sea-air fighting than our method, under the direction of Admiralty, War Office and Air Ministry, which has produced a complicated and cumbersome system of supply, training, planning and higher direction.

THE PROBLEM OF TO-DAY

We now urgently need to obtain 100 per cent. co-operation between the three fighting services, and for this purpose to evolve a system of preparation, planning and command that shall meet all our strategical and tactical needs. There are, therefore, three stages to consider. First the preparation stage, which involves the construction and supply of material exactly suited to the needs of the three fighting services: also the supply and suitable training of all the personnel that will have to operate aircraft over land or sea. This alone is a colossal problem. Next we must find or produce officers with the ability and imagination to forecast the developments and needs of the future and make plans accordingly.

These officers must in some measure possess the gift of prophecy, a rare gift but not entirely extinct. In ancient days the gift of prophecy was always expected to be exercised by the priesthood. It is an interesting fact that our prophets prior to 1940 were almost exclusively laymen. History, however, repeated itself, and the few prophets who tried to warn

the people received little honour or attention. If, after the war, anyone were to collect together the books and papers full of categorical warnings that were written before 1939 by publicists, politicians, officers of the services, and civilians of every description, the total would indeed be staggering; and there must have been an even greater volume of secret intelligence reports sent direct to Government departments or to the Foreign Office.

Among my own records, commencing in 1913, when I first used in print the quotation "I cannot hold my peace because thou has heard, O my Soul, the sound of the trumpet, the alarm of war," are a tedious collection of papers urging the authorities to prepare adequately for the approaching storm. But prophecy was really quite unnecessary for the clearest warning of all came from the self-revelation of that inhuman monster who wrote "Mein Kampf."

Next, in the realm of execution, we need officers for high command who have imagination, the personality which lends itself to harmonious co-operation, and the ability to think in three dimensions and handle with success the weapons of all three fighting services. Such men are at present very rare. In the days of Napoleon, war was almost entirely two-dimensional. The submarine some forty years ago introduced the third dimension, and now the aeroplane has provided to the art of war such new and varied complexities that one may almost suggest the desirability of being able to think in four dimensions. Certainly this would be no exaggeration if we regard time as the fourth dimension; and, whether we accept this or not, there is no denying that time in war is a factor more vital than most people suppose. It was when fighting forces moved at only a tenth of the speed they move now, that a wise man wrote, "in war, time is counted by minutes not by hours." To-day, those minutes are short and crowded.

POSSIBLE SOLUTIONS

There are many factors and difficulties to consider, each with a number of pros and cons attached. When two or more Commanders-in-Chief are required to prepare for and plan a combined operation, there are three vital questions that each would probably ask himself.

1. Is the available material suitable for the purpose and is there enough of it? Needless to say the material under consideration would be the fighting material of all three services.
2. Is the personnel suitably trained for handling this material with complete success in a combined operation of all arms?
3. Shall I obtain from the other Commanders-in-Chief concerned willing, loyal and enthusiastic co-operation?

Everyone will agree on the extreme desirability that the answer to each of these questions should be "Yes." One wonders, in passing, whether they were asked and how far they were satisfied when we sent our army to Norway and afterwards to Greece? It was once said, very wisely, that if a General is ordered to fight under conditions where he would expect to be defeated, he should refuse to do so. This rule surely must apply equally or more so if the heads of fighting services are ordered to execute strategic movements that may be fraught with even graver consequences. It is not suggested that such orders have been given, but we need to be sure that our organisation for the higher direction of the

war, which will be dealt with later, shall make it very difficult or even impossible for such things to happen.

MATERIAL

Let us now deal briefly with the three questions above. On material, day to day discussions must of course take place between the Admiralty, War Office and Air Ministry. Obviously, however, the need of any special types of weapons for the Army or Navy must complicate the supply problem of the R.A.F., and the demand for them will therefore be looked on with disfavour by the Air Ministry. Further, the process of designing at the Air Ministry and then experimenting with special types or weapons that are needed by the other services (e.g. the torpedo bomber and torpedoes for it) must be a difficult and often lengthy process. It has been said on good authority that when a new type of aircraft is required one could usually expect a delay of five to six years before the new (or no longer new !) machine went into production.

The best solution of this difficult production problem can only be reached after a full inter-service discussion of all the pros and cons. A strong committee for the purpose would seem to be indicated.

TRAINING

Still more difficult is the question of training. A certain number of squadrons will no doubt be specially trained for Army co-operation and a large number of officers and men will also be specially trained for working in the Coastal Command or the Fleet Air Arm. Such forces in the past have usually operated with much loyalty and with great efficiency and success. But there remains the great bulk of the R.A.F. personnel which has been given no special training for co-operation in battles on land or sea. It is here that a rapid change is urgently needed. How much or what kind of training they could be given in time of war it is difficult to say—that is a matter for a conference of experts—but it is quite certain that they must have some training in combined operations if we are to win the war as quickly as possible. One of the first principles of tactics is that "it is impossible to be too strong at the decisive point," and the decisive point may be the scene of a land battle on a thousand mile front. Equally it may be a naval action in the North Sea or far out in the Atlantic. The extraordinary success of the Soviet armies in holding up and then forcing back the great German offensive could never have been achieved with the aid only of a few special squadrons of Army co-operation aircraft. Without doubt, practically the whole of the huge Russian Air Force was suddenly switched over to Army co-operation.

One of the primary German aims since war began has been to break the British Navy. To a small extent they sought this aim by bombing naval bases such as Rosyth, Portsmouth, Portland and Plymouth. But apart from this bombing, a very large section of the *Luftwaffe* was undoubtedly switched to naval co-operation and working over the sea. For example, the *Luftwaffe* laid innumerable mines all round the British Isles: they attacked our war and merchant ships not only on the coast of Norway but also while on passage to and from Norway: they attacked and destroyed many of our war and merchant ships in the North Sea and English Channel. The dive bomber proved especially deadly for the

destruction of our ships, and unfortunately the R.A.F. had no similar weapon with which to attack German ships. (Can it be that the R.A.F. would never take an interest in dive bombers because they were of no direct assistance for winning battles in the air?) Having learnt the immense power of the *Luftwaffe* over the sea (which apparently we had failed to learn) the Germans took full advantage of our desperate adventure when we sent an army to Greece and Crete without giving it an adequate air contingent. The damage then done to our warships was such that we must have been in grave danger of losing the command of the Mediterranean. One may suppose that we should certainly have lost it if the Italian Fleet had been manned by Germans.

The above illustrations show that while the Russians were capable of switching their main Air Force to Army co-operation, the Germans, who undoubtedly used enormous air forces to work with their Army in Poland, Holland and France, must at other times have used a very large portion of the *Luftwaffe* for Navy co-operation. It is therefore essential that, so far as may be possible, every part (or almost every part) of the R.A.F. shall be capable of co-operating effectively with Army or Navy when urgent necessity or the demands of Grand Strategy require it.

An independent air force that cannot display this necessary degree of versatility will be in grave danger of losing the war when opposed to an air force that can. In this as in other respects we must advance with the times or perish, not forgetting that those who desire to hold us back will always have very plausible arguments at their disposal. What, for example, could be more plausible and convincing than the following memorandum sent to the Privy Council in 1591 by Colonel Sir John Smyth :

"The bow is a simple weapon, firearms are very complicated things which get out of order in many ways. Your firearm, moreover, is a very heavy weapon and tires out soldiers on the march. Whereas also a bowman can let off six aimed shots a minute, a musketeer can discharge but one in two minutes."

There is, in fact, so much to be said for Sir John's argument that he would no doubt be delighted to hear that bows and arrows have been used with some effect by Borneo natives in recent fighting against the Japanese.

In training, as also in organisation, planning and supply, there are so many questions to be examined and answered that no attempt can be made, nor do I pretend to have the necessary knowledge, to produce the answers here. For instance, is it desirable that the Navy should man and operate all flying boats? Is it desirable that the Navy should carry out all reconnaissance over the sea and should be given the necessary air forces for the purpose? Should the Navy and Army commander be given direct control of all the air forces that are co-operating in a sea or land battle? To what extent should the R.A.F. have autonomy in connection with initial flying training, the control of strategical bombers and certain classes of fighters? To what extent can integration be achieved with those forces that will be taking part in major battles on land or sea? To what extent can long range bombers be made adaptable to other uses when necessity arises (e.g. reconnaissance over the sea? bomb or torpedo attack on warships at sea? etc.). Would it be useful to group together long range fighters with medium and light bombers for Army and Navy co-operation work?

The above list could be continued almost indefinitely but there is no value in extending it here.

COMMAND

There is no need to discuss here whether our separate Air Force should be continued, for that matter may be looked on as settled, but as a matter of academic interest it may be recorded that the results we need could probably be achieved just as well with the Russian or Japanese system if we had not in 1917 adopted a different one.

There are certain advantages in having only two fighting services, with aircraft divided as necessary between them. We could then be sure that every General and Admiral would be air-minded, because they would constantly be responsible for the operation of aircraft and they could not fail to realise their importance. In Combined Operations the planning and the execution would be in the hands of the two men instead of three. Also we should avoid the further sub-division of our fighting forces. At present we have five or more sections; the Army, the Navy, and the R.A.F. make three. But the R.A.F., while deprecating the dividing up of the air forces, has for some time owned a private fleet consisting of numerous small craft used for rescue work around our coasts; and is now creating a private army for the purpose of defending aerodromes, thus making two more sections of our fighting forces. If Army Co-operation units were separated from the R.A.F. we should have a total of six; but the adoption of the American system would mean that there could never be more than four, i.e. Army, Navy, and an air force consisting of twin halves closely linked together and trained to co-operate in every kind of joint operation. There, however, can be no doubt that any such change during the war is neither feasible nor desirable, and after the war it is to be hoped that all three Services may agree that no change is necessary. It is quite possible to meet all requirements with our present system and if the Services are prepared to co-operate whole-heartedly, as no doubt they are, they should be able to prove that the present system does not need to be changed. The German system is very efficient and is somewhat similar to ours, though apparently the German air forces operating with Navy or Army are, tactically, entirely under the orders of the Naval and Military Commanders.

Assuming, therefore, that our present organisation is to remain more or less unaltered, the question of Command in the field must now be considered. There are two systems that, so far as we know, seem to work reasonably well, viz. control by three equal Commanders-in-Chief as in Libya, and control of all three forces by one man as in the A-B-D-A area. The latter really means control by four men, for under the Generalissimo there must be a Commander (or Commander-in-Chief) for each of the three services. In the A-B-D-A area, for example, we apparently had a British Admiral, commanding certain naval forces, working under a Dutch Admiral who in turn took orders from the British Generalissimo: there was also, of course, an Army Commander and an Air Force Commander. Both these systems are immensely dependent on finding personalities who can work harmoniously together. The British Empire was very largely built up by combined military and naval expeditions, but even when we had only two Services to consider there were frequent cases of friction between co-equal Commanders. Such friction inevitably causes serious trouble and sometimes complete failure.

The advantage of the Generalissimo is that he can give orders to his three subordinates, he can detect and rectify incidents over which they

disagree, and if necessary he can report to his Government that one of his subordinate Commanders is incapable of harmonious co-operation and must be relieved. The Generalissimo might be soldier, sailor or airman, because even if, as is probable, he does not know all about the handling of all three Services, he will constantly have to consult his subordinate Commanders as to how far they can go towards meeting his wishes. He will have to confer with them constantly and be largely guided by their expert opinions. The Generalissimo must, however, have a wide practical knowledge of all three Services, he must possess imagination, the ability to decentralise, and the power of getting the best out of those who work under him.

In the case of the Libya system, with three equal Commanders-in-Chief, there must be considerable difficulty when disagreement occurs. How this has been dealt with in Libya is not known, but one possibility would be for the senior officer of the three to give a final decision when necessary. Another alternative would be to agree that for any particular operation, the Navy, Army or Air Force was to be looked on as the pre-dominant partner. An immense amount of give and take will in any case be necessary. For example, the planning of a major offensive in Libya might require the advance to battle of a hundred thousand troops while support was provided along the coast by the bulk of the Mediterranean Fleet. The General would work out the minimum Air Force necessary to give him victory in the land battle, while the Admiral would calculate the minimum Air Force necessary to assist him in battle if he meets the enemy fleet, and also to give him permanent protection from the possibility of an air attack on his fleet similar to that which sank the Prince of Wales. It must be remembered that such an air attack might come practically without warning, while a naval action might develop with only a few minutes notice.

What is to be done if the total Air Forces available are not sufficient to meet the requirements of the Admiral and the General? This is a matter that could be decided at once by a Generalissimo, because it would be his primary duty to deal with such problems. Without him, it must be discussed and agreed by the three Chiefs in conference. If the decision were to be left entirely to the A.O. Commander-in-Chief it is very possible that neither the Admiral nor the General would be satisfied. It is therefore necessary to have an agreed decision of the three Chiefs, and if the Naval or Military Commander considered that the air forces allocated to him would not permit of his mission being effectively carried out, the fact would have to be represented to higher authority.

There would be a big difference in the method of exercising command at home and abroad, for at home the air forces, instead of being under one Commander-in-Chief, would be divided under the Commanders-in-Chief of the Bomber, Fighter and Coastal Commands. The Army would be working under one or perhaps more Commanders-in-Chief in different parts of the British Isles, and our naval forces in home waters would be under a number of different flag officers. There are heavy ships under the command of the Commander-in-Chief Home Fleet, while local forces work under the orders of Commanders-in-Chief at Plymouth, Portsmouth, Chatham and Rosyth, with a Vice-Admiral at Dover. The only difference from the last war is that there is now an additional Commander-in-Chief of the North-Western Approaches. Therefore, when it comes to studying concerted action, as for an invasion of Britain, we have to deal with

fighting forces working under about a dozen separate Commanders. It is not argued that this is unsatisfactory or wrong, but it goes to show that the problem of co-ordination and joint planning is not an easy one.

At this point we come to the "higher direction of the war," which is the crux of the whole matter. Immediately over our twelve or thirteen Home Commanders, and also of course directing operations in all parts of the world, are the Admiralty, War Office and Air Ministry. Each of these has a Service Chief, with a large staff, who to some extent can exercise the functions of a Commander-in-Chief in the field. But actually he is far less free, for in each establishment there is a civilian minister permanently in session who is senior to the Chief of Staff and can dismiss him at any time that he pleases. The Chief of Staff in Whitehall is therefore rather like a Russian Admiral who has a political commissar living with him in his flagship.

If this were all, it would matter little, for the political chief can usually be relied on to use his discretion and to help and not to hinder. But the Chiefs of Staff are overshadowed by politicians in other directions and it is therefore inevitable that political considerations should weigh heavily when strategical decisions are being made. The bigger decisions are made at one of three places; perhaps at a Chiefs-of-Staff meeting, where the Prime Minister is occasionally in the chair; perhaps at a meeting of the Defence Committee, where the Chiefs-of-Staff and the three Service Ministers will be present, with the Prime Minister in the chair. Finally, the biggest decisions of all will be made by the War Cabinet whose members, except for the Prime Minister, normally spend none of their time studying strategic problems of any sort! Neither the Service Ministers, who at least are constantly in touch with such problems, nor the Chiefs-of-Staff, are members of the War Cabinet!

These remarks about Higher Direction are put in mainly because every big reform or improvement must come from the top. The younger officers are not only ready but are aching to see it: they only wait for those at the top to recognise what is needed and give the word. The chief needs are: first to leave the Chiefs-of-Staff to get on with the strategic movement of our forces, without taking up too much of their time discussing alternative and perhaps very plausible schemes with their political chiefs. It should, of course, be clearly understood that all Grand Strategy must be submitted to and approved by the War Cabinet. Next, to ensure that in the whole field of preparation, planning and execution, the three Services co-operate more constantly and far more closely than in the past. In certain directions integration should take the place of co-operation. In this respect the situation is changing gradually, but not rapidly, from day to day, for we started the war with a strong tendency to "Isolationism" in all three Services, especially in the R.A.F., which is being steadily broken down as the need for doing so becomes more and more obvious. Further progress will no doubt be made before these words, written early in February, 1942, appear in print.

A useful way to expedite the process might be to appoint a Committee to examine all the ways in which improvement could be attained. They would collect constructive suggestions from all three Services and listen to complaints, if any, that each service might wish to bring forward for discussion. They would then produce recommendations regarding changes or improvements that they considered suitable for immediate adoption.



Returning from a raid. Commando troops in a special landing craft.
(British Official photograph.)

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A German submarine base on the French coast. St. Nazaire from the air.

If these were based on a frank and full discussion of the whole situation it is highly probable that all three Services would gladly agree at least to give the Committee's proposals a loyal and thorough trial. It may be argued that the present is not a good time to embark on changes or experiments. It should be remembered, however, that big changes, not, as some hold, for the better, were carried through in 1917.

If, as an immense number of people believe, we are able now to make changes that would help us to win the war quicker and more decisively, it would be a tragic error not to do so.

FLAG OFFICER.

CHAPTER IX.

THE BATTLE OF THE RIVER PLATE.

THE OFFICIAL ACCOUNT

Compiled in the Admiralty from despatches forwarded by Rear-Admiral Harwood and the Captains of H.M. Ships Ajax, Achilles and Exeter

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"In this sombre dark winter . . . the brilliant action of the Plate . . . came like a flash of light and colour on the scene, carrying with it an encouragement to all who are fighting—to ourselves and to our allies."—First Lord of the Admiralty when welcoming H.M.S. Exeter, February 15, 1940.

The action which led to the defeat and subsequent self-destruction of the German "pocket battleship" Admiral Graf Spee was made up of four distinct phases. First there were the preliminary movements which made the victory possible. Secondly there was the main battle. Thirdly there was the long shadowing action while the enemy was running for the safety of neutral territorial waters. Finally there was the long watch of the River Plate Estuary, with the Admiral Graf Spee hourly expected to make a dash for the open sea.

In the following account of the action, which has been compiled in the Admiralty from despatches forwarded by Rear-Admiral Harwood and the Captains of H.M. Ships Ajax, Achilles, and Exeter, all the times given are the ships' time kept by the Squadron. This was two hours slow on Greenwich Mean Time.

THE FIRST PHASE.

It had been known since the s.s. Clement was sunk on September 30 that a German "pocket battleship" was at large in the South Atlantic Ocean, and the fact that four ships on the Gibraltar to South Africa route were overdue had indicated that this ship was raiding commerce on the eastern side of the South Atlantic. In mid-November, however, the sinking of the s.s. Africa Shell at the southern end of the Mozambique Channel proved that there was a German commerce raider in the southern part of the Indian Ocean. Whether this was the same raider as had been operating in the South Atlantic Ocean was not definitely known at that time. In any case, vigilance in the South Atlantic could not be relaxed.

Apart from the forces concerned in a systematic search of other areas, there were in the western part of the South Atlantic four cruisers of the South America Division under the command of Commodore H. H. Harwood. Early in December it had been necessary to detach H.M.S. Cumberland, the largest and most powerful of the force, to the Falkland Islands to carry out a self-refit, remaining at short notice. Upon the three remaining ships devolved the gigantic task of watching and defending the immensely valuable trade routes off the South American continent. This they had to do, knowing that there was at large an enemy raider more powerful than their combined strength—even if they were able to bring their combined strength to bear upon the enemy at the moment of contact.

The British cruisers of the South America Division immediately available were :—

H.M.S. Ajax wearing the Broad Pendant of Commodore Harwood, a 7,000-ton cruiser armed with eight 6-inch guns.

H.M.S. Achilles.—A cruiser of the same class as H.M.S. Ajax, 7,000 tons and armed with eight 6-inch guns. This ship had been detached from the New Zealand Division and was manned largely by New Zealanders.

H.M.S. Exeter.—A cruiser of 8,400 tons armed with six 8-inch guns.

There was little doubt that the German raider was one of the so-called "pocket battleships"—a vessel of rather more than 10,000 tons with a main armament of six 11-inch guns and a secondary armament of eight 5.9-inch guns. Moreover, the "pocket battleships" are protected by armour against which 6-inch gun fire could not be expected to be fully effective at long ranges. The German raider, therefore, had a considerable advantage in armament. Her *secondary* armament was the equal of the total armament of one of the smaller British cruisers, and the weight of metal and explosive which she could fire in one broadside was 4,700 lb. The total weight of the broadsides of all the three British cruisers combined was only 3,136 lb.

Against the serious inferiority in armament, the British cruisers could put an advantage of about six knots in speed and, possibly, a greater handiness.

The two essentials to successful action against the enemy were, therefore, concentration of the British forces prior to action being joined, and the employment of tactics which would exploit the advantage in speed and handiness of the British forces. These were problems not easy of solution, because the immense area to be guarded made it necessary for the British forces to be dispersed—a factor which precluded the frequent practising of squadron tactics.

On December 3, 1939, the three British cruisers were scattered over 2,000 miles.

It was on the afternoon of that day that a report was received from the British s.s. Doric Star that she was being attacked by a German "pocket battleship" on the eastern side of the South Atlantic about midway between Sierra Leone and the Cape of Good Hope. The Doric Star had sent out the wireless message in spite of the fact that the German raider was firing on her in an attempt to prevent her from using her wireless.

Commodore Harwood correctly anticipated that the raider, knowing that she had been reported by the s.s. Doric Star, would leave that area and probably cross the South Atlantic. He estimated that the raider could reach the Rio de Janeiro area by the morning of December 12, the River Plate area by that evening or the following morning, or the Falkland Islands area by December 14.

There was nothing to indicate which of these three areas—separated from one another by more than 1,500 miles—was the raider's objective. Commodore Harwood decided, however, that the most important area to be defended was the focal area of the large and very valuable trade off the River Plate. He therefore ordered his squadron to concentrate 150 miles off the River Plate Estuary. He also made arrangements to ensure that his ships would not be short of fuel when they arrived at the rendezvous. All this was done in one short signal, after the transmission of which no

wireless communication was used, since this would have indicated the movements of British forces to the enemy.

Accurate navigation led to the concentration of the British cruisers at the expected moment—7 a.m. on December 12.

The greatest use was made of that day. Commodore Harwood explained to his captains the tactics which he proposed to use in the event of contact being made with the powerful raider. These tactics were then exercised by the squadron. It is noteworthy that the final words of Commodore Harwood's instructions to his captains were to act "without further orders so as to maintain decisive gun range."

Wednesday, December 13, dawned fine and clear, with extreme visibility. There was a fairly strong breeze from the south-east, a low swell coming from the same quarter, and a slight sea. The British cruisers were steaming east-north-east at 14 knots. They were in single line ahead in the order H.M.S. Ajax, H.M.S. Achilles, H.M.S. Exeter.

At 6.14 a.m. smoke was sighted on the horizon just abaft the port beam, and H.M.S. Exeter was ordered to investigate. Two minutes later H.M.S. Exeter reported "I think it is a pocket battleship." The enemy was in sight. Contact had at last been made between British naval forces and the raider which they had been hunting for more than two months.

THE SECOND PHASE.

At the time of the sighting of the smoke, the Admiral Graf Spee and the British cruisers were steering converging courses. As soon as the smoke was identified as that of the German raider, the ships of the British squadron began to act in accordance with the tactics practised on the previous day. All ships increased speed and began to work up to full speed as rapidly as possible. The 8-inch gun cruiser, H.M.S. Exeter, the most powerful unit of the British squadron, made a large alteration of course to the westward, while the two 6-inch gun cruisers, H.M.S. Ajax and H.M.S. Achilles, forged ahead to the north-eastward, altering course slightly in order to close the range rapidly. These manoeuvres were carried out so that the "pocket battleship" should be simultaneously engaged from widely different angles. This would force him either to "split" his main armament in order to engage both units, or to leave one of the British units unengaged by his 11-inch guns.

At 6.18 a.m., only four minutes after the first sighting of smoke, the Admiral Graf Spee opened fire with her main armament of six 11-inch guns. She had "split" her main armament, and one turret fired at H.M.S. Exeter and the other at H.M.S. Ajax and Achilles. The range was very long, but it was being shortened rapidly by all three of the British cruisers.

Two minutes later, at 6.20 a.m., H.M.S. Exeter opened fire with her two forward turrets—four 8-inch guns. The range was then $9\frac{1}{2}$ sea miles. Her two after guns opened fire as soon as they would bear, two and a half minutes later. This 8-inch gunfire seemed to worry the enemy almost from the beginning. After shifting target rapidly once or twice, the Admiral Graf Spee concentrated the fire of all six of her 11-inch guns on H.M.S. Exeter. The Admiral Graf Spee's first salvo fell short of H.M.S. Exeter. The second was over, and the third straddled the cruiser.

Meanwhile, H.M.S. Ajax and H.M.S. Achilles had opened fire with their 6-inch guns. H.M.S. Achilles opened fire at 6.21 a.m. and H.M.S. Ajax two minutes later. These two 6-inch gun cruisers immediately developed

a high rate of fire, combined with great accuracy. The despatch of H.M.S. Achilles states that "fire appeared to become rapidly effective," while the despatch of H.M.S. Ajax states that "effective fire developed immediately."

At 6.28 a.m. an 11-inch shell burst just short of H.M.S. Exeter, abreast the middle of the ship. Splinters from this shell killed the torpedo tubes crews, damaged the communications of the ship, and riddled the funnels and searchlights. One minute later H.M.S. Exeter suffered a direct hit from an 11-inch shell. This shell struck "B" turret, putting that turret and its two 8-inch guns out of action. Splinters from that shell swept the bridge. All the bridge personnel except the captain and two others were either killed or wounded. The wheelhouse communications were wrecked.

Momentarily, the ship was out of control. Good training, however, came to the rescue. As soon as it was realised in the lower conning position that communications with the wheelhouse had ceased to function, that lower position took over the steering. Even so, the ship had begun to swing to starboard, and there was danger of the after guns becoming unable to bear on the target. This was noticed by the torpedo officer, who, on his own initiative, succeeded in getting an order through to the lower conning position which resulted in the ship being brought back to her course.

The captain of H.M.S. Exeter was at this time making his way aft. With the bridge out of action, he had decided to fight his ship from the after conning position. When he reached that position, however, he found that all communications from the after conning position had been destroyed. The steering was therefore changed over to the after steering position, and communication established with that position by means of a chain of messengers. H.M.S. Exeter was controlled in this way until the action was broken off. It would be difficult to overestimate the difficulty of controlling a ship by this means during a fierce action, with personnel exposed to 8-inch gun blast as well as heavy fire from the enemy.

During this time H.M.S. Exeter received two more hits forward from 11-inch shells, and also suffered some damage by splinters from shells bursting short.

Meanwhile H.M.S. Ajax and H.M.S. Achilles were making good and rapid shooting with their 6-inch guns, and they were closing the range rapidly and drawing ahead on the enemy. That this 6-inch gunfire was causing the enemy trouble was shown by the fact that at 6.30 a.m. the Admiral Graf Spee again "split" her main armament, switching over one 11-inch turret to engage the 6-inch gun cruisers. This temporarily reduced the volume of heavy fire to which H.M.S. Exeter was subjected.

The secondary armament of the Admiral Graf Spee—5.9-inch guns—had been alternately engaging H.M.S. Ajax and H.M.S. Achilles, but without effect, although some salvos had fallen close. These guns continued to fire at the 6-inch gun cruisers.

At 6.32 a.m. H.M.S. Exeter fired her starboard torpedoes at the enemy. These torpedoes went wide, because the Admiral Graf Spee, apparently finding the British gunfire too hot, turned 150 degrees away under cover of a smoke screen before the torpedoes reached her.

By 6.36 a.m. the 6-inch gun cruisers were doing 28 knots. This rapid increase of speed—the ships had been doing 14 knots only 20 minutes previously—reflects great credit upon the engine- and boiler-room personnel.

At 6.37 a.m. H.M.S. Ajax catapulted her aircraft. Orders to get the aircraft into the air at the earliest possible moment had been given as soon as the alarm was sounded, and the catapult had been prepared and the engine of the aircraft warmed up. The operation of preparing to catapult the aircraft was carried out with great coolness, in spite of the fact that the personnel, and particularly the pilot and the observer of the aircraft, were subjected to severe gun blast from the guns of the two after turrets, which were firing on a forward bearing. The aircraft itself was whipping about badly owing to the gunblast. As soon as the aircraft was in the air it took up a position on the disengaged bow of the 6-inch gun cruisers.

At about 6.38 a.m. H.M.S. Exeter made a large alteration of course to starboard in order to bring her port torpedo tubes to bear on the enemy. As she was turning she received two more hits from 11-inch shells. One of these hit the foremost turret, putting the turret and its two 8-inch guns out of action. The other entered the hull, did extensive damage, and started a fierce fire between decks. The observer in H.M.S. Ajax's aircraft reported that "she completely disappeared in smoke and flame and it was feared that she had gone. However, she emerged, and re-entered the action."

H.M.S. Exeter had, indeed, suffered severely from the much heavier metal of her adversary. Two of her three turrets were out of action, and the only two guns still in action were aft. All her compass repeaters had been smashed, and the captain was conning the ship with the help of a small boat's compass. What little internal communication was possible was done by messengers. Some compartments were flooded, and a serious fire was raging in her hull. Nevertheless she was resolutely kept in action. Her port torpedoes were fired as soon as the tubes were brought to bear on the enemy. A minute or two later H.M.S. Exeter altered course to port—that is, towards the enemy—and hauled round so that she was on a course approximately parallel to that of the Admiral Graf Spee and able to continue to engage the enemy with her two remaining guns. By this time H.M.S. Exeter had a 7-degree list and was down by the bow, but was still steaming at full power.

At 6.40 a.m. an 11-inch shell burst just short of H.M.S. Achilles, in line with the bridge. Splinters from this shell killed four ratings in the main gunnery control position and stunned the gunnery officer, as well as slightly wounding the captain and the chief yeoman of signals on the bridge. Fortunately these splinters did not put the director out of action or damage any important instrument. Nevertheless, the main control position was momentarily out of action through these casualties. The gunnery efficiency of H.M.S. Achilles was not, however, impaired. The secondary control position immediately took over the control of the ship's armament, and continued the action until the main control position was ready to resume control some minutes later. The greatest gallantry and fortitude was shown by the surviving personnel of the main control position. A sergeant of Royal Marines remained uncomplainingly at his post and carried out his duties until the end of the action although he was seriously wounded. A seaman boy behaved with exemplary coolness despite the carnage around him and continued his duty of passing information to the guns. He was at one time heard denying most vigorously a report of his own death which had spread round the ship. These were but two instances of gallantry in a fierce action memorable for the bearing of the personnel of the British cruisers.

After 6.40 a.m. the action became virtually a chase. The Admiral Graf Spee had turned away to the westward under cover of a smoke screen, and the two 6-inch gun cruisers were hauling round to the north-westward in pursuit, accepting the fact that this entailed being unable to bring the after guns to bear on the enemy. They were by now doing 31 knots and still increasing speed. H.M.S. Ajax and H.M.S. Achilles were fine on the starboard quarter of the Admiral Graf Spee, and H.M.S. Exeter was rather before the enemy's port beam, still in action with her two remaining guns.

At 6.56 a.m. H.M.S. Ajax and H.M.S. Achilles altered course to starboard in order to bring all their guns to bear again. This greater volume of fire from these two cruisers appeared to have an immediate effect on the enemy, for the Admiral Graf Spee at once altered course away from the cruisers, and at 7 a.m. she laid a smoke screen in an attempt to throw off the British gunfire. From this time onwards the Admiral Graf Spee made frequent alterations of course and great use of smoke screens in her efforts to escape further punishment.

At 7.10 a.m. the range of the enemy from H.M.S. Ajax and H.M.S. Achilles was still 8 miles. Commodore Harwood decided to alter course towards the Admiral Graf Spee in order to shorten the range as rapidly as possible, even though this meant that the after guns would once again be unable to bear on the enemy. The British cruisers were now steaming at their utmost speed.

At 7.16 a.m. the Admiral Graf Spee made a drastic alteration of course to port under cover of smoke. She was then steering almost directly for H.M.S. Exeter, and it seemed that her intention was to finish off that damaged cruiser. Four minutes later, however, the effective support of H.M.S. Exeter's consorts obliged the Admiral Graf Spee to make another large alteration of course. She hauled round to the north-westward until all her 11-inch guns would bear on H.M.S. Ajax and H.M.S. Achilles, and at once opened fire on the small British cruisers. The range at that time was $5\frac{1}{2}$ miles. H.M.S. Ajax was straddled by 11-inch salvoes, but she was not hit. The enemy was also firing with her secondary armament of 5.9-inch guns, but their fire had by this time become inaccurate and ragged.

At 7.20 a.m. H.M.S. Ajax and H.M.S. Achilles had turned to starboard to bring all guns to bear on the enemy. Rapid and accurate shooting was maintained, and a fire was observed amidships in the Admiral Graf Spee.

At this time it appeared to Commodore Harwood that the Admiral Graf Spee intended to neglect H.M.S. Exeter and to close the 6-inch gun cruisers on a north-westerly course. Thinking that the enemy was likely to remain on this course for some time, H.M.S. Ajax swung to starboard at 7.24 a.m. and fired her port torpedoes at a range of $4\frac{1}{2}$ miles. The enemy probably saw these torpedoes being fired, for the Admiral Graf Spee at once made a large alteration of course, turning away some 130 degrees to port and at the same time laying a smoke screen. Although the Admiral Graf Spee altered back to her north-westerly course three minutes later, this large alteration of course was sufficient to avoid the torpedoes from H.M.S. Ajax.

At 7.25 a.m. H.M.S. Ajax was hit by an 11-inch shell. This shell put X turret out of action, and, by a stroke of bad luck, it also led to the jamming of Y turret. Thus this one shell robbed H.M.S. Ajax of the use of four of her guns, besides causing a number of casualties.

It was at about this time that the pilot of H.M.S. Ajax's aircraft, which had been spotting the fall of shot for the 6-inch gun cruisers, decided to

approach the Admiral Graf Spee in an attempt to discover the extent of damage that ship had received. As soon as the aircraft came within range of the enemy's anti-aircraft guns, these opened fire. As the primary and most important duty of the aircraft was spotting the fall of shot for the control of the British cruisers' gunfire, the aircraft retired out of range of the enemy's anti-aircraft guns.

H.M.S. Exeter had been dropping gradually astern, as she had been forced to reduce speed owing to the damage forward. She still continued in action, however, engaging the enemy with her two remaining guns firing in local control under the direction of an officer standing in an exposed position on the searchlight platform. At about 7.30 a.m., however, H.M.S. Exeter's remaining turret ceased to operate due to flooding. Thus H.M.S. Exeter could no longer engage the enemy nor keep up with the action. Reluctantly, therefore, she was forced to break off the action, and at about 7.40 a.m. she turned to the south-east and steamed away at slow speed, starting to repair damage and make herself seaworthy.

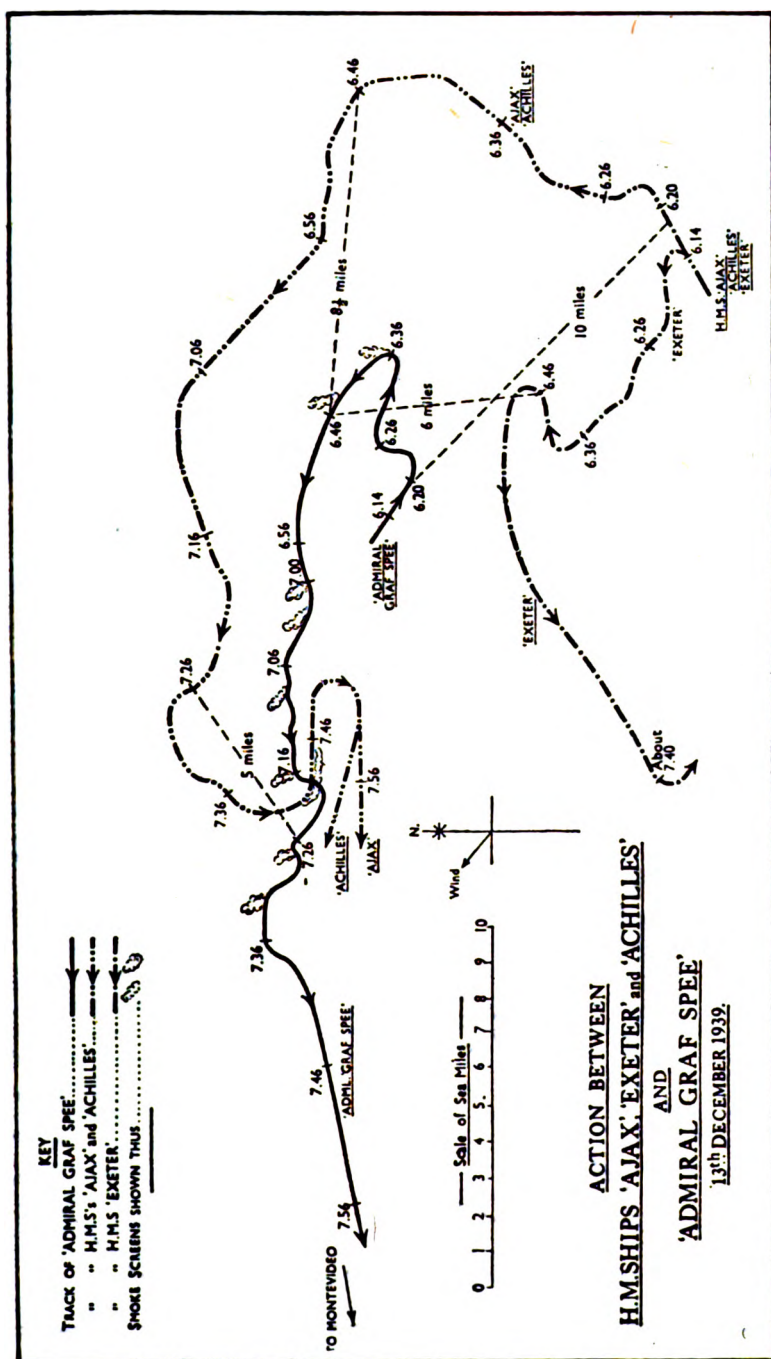
That H.M.S. Exeter was still afloat and capable of making long sea passages is a tribute to the design and construction of British warships. For the fortitude and resolution of the personnel no praise could be too high. In spite of severe casualties and the almost complete destruction of internal communications, H.M.S. Exeter had been kept in action so long as a gun would fire, while fire and repair parties fought to minimise the effects of damage.

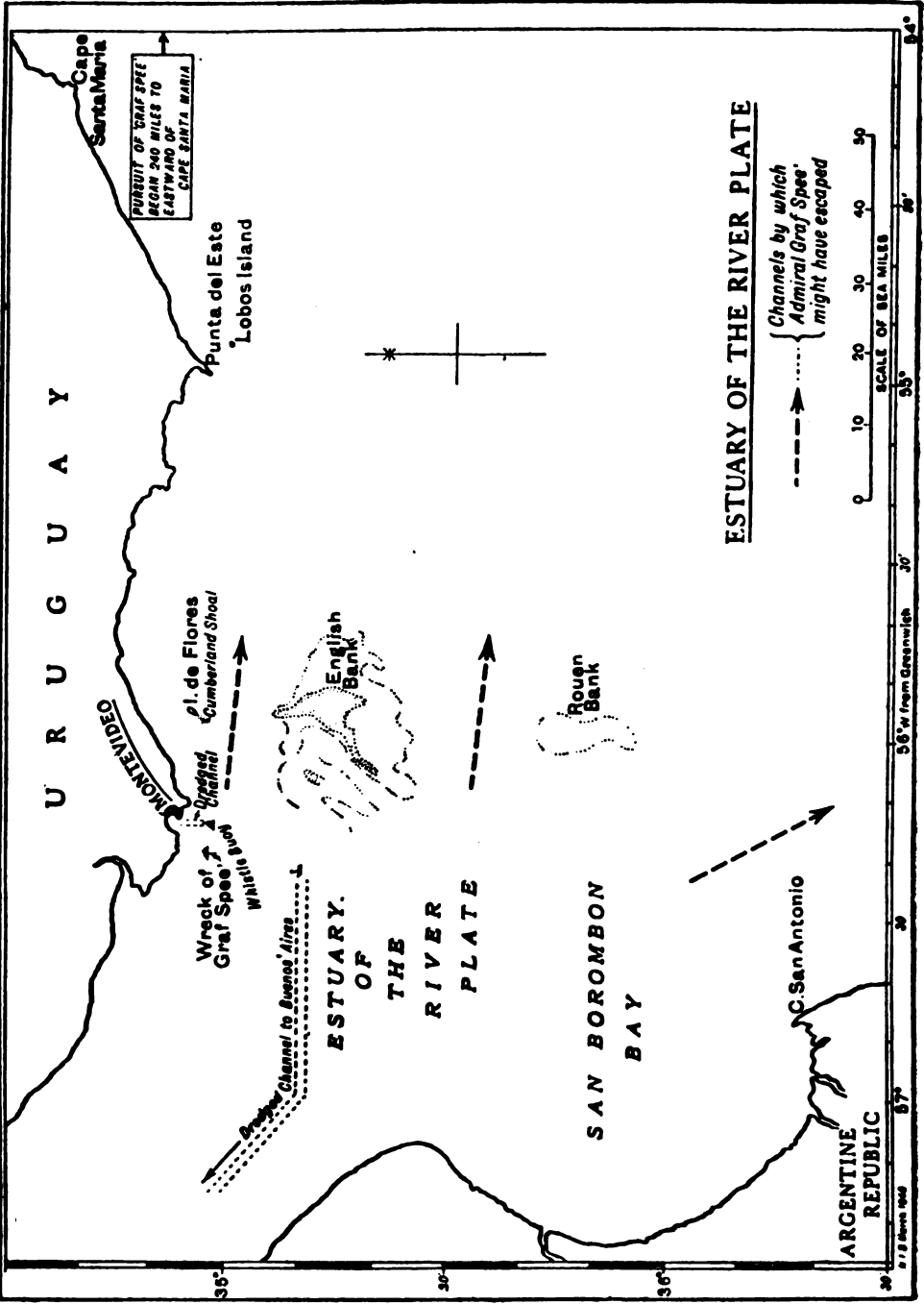
At 7.28 a.m. H.M.S. Ajax and H.M.S. Achilles hauled round to a westerly course in order to close the range still further. Three minutes later H.M.S. Ajax's aircraft reported "Torpedoes approaching. They will pass ahead of you." Commodore Harwood, however, decided to take no chances, and the cruisers made a large alteration of course towards the enemy in order to avoid the torpedoes. This alteration of course had the effect of closing the range very rapidly. At this time H.M.S. Ajax had only three guns in action, as an accident prevented one gun of B turret from being fired, while both X and Y turrets were out of action as a result of the 11-inch shell hit sustained at 7.25 a.m. Nevertheless, the enemy did not relish the fire of the small British cruisers. The Admiral Graf Spee turned away to the westward almost immediately, making much smoke and zigzagging in an attempt to throw out the British gunfire.

At this stage of the action the shooting of the 6-inch gun cruisers appeared very accurate. H.M.S. Achilles was making excellent practice with her eight guns, while H.M.S. Ajax was making very good use of her three remaining guns. At 7.36 a.m. the Admiral Graf Spee turned to the south-westward in order to bring all her heavy guns to bear on the British cruisers in an attempt to fight them off. The two small British cruisers stood on, however, and by 7.38 a.m. the range was down to 4 miles.

It was then reported to Commodore Harwood that so many rounds had been expended during the continuous periods of rapid firing that there was some danger of running short of ammunition, if the action was prolonged without reaching a decision. This led Commodore Harwood to adopt an immediate change in tactics. He considered that by breaking off the day action and shadowing the enemy till nightfall, he would have a better chance of closing to a range at which his lighter armament and torpedoes would have a decisive effect.

Accordingly, at 7.40 a.m., Commodore Harwood turned H.M.S. Ajax and H.M.S. Achilles away to the eastward under cover of a smoke screen.





Just as the ships began to turn, an 11-inch shell from one of the Admiral Graf Spee's last salvos brought down the main topmast of H.M.S. Ajax. The bursting of this shell caused some casualties, and the falling of the mast destroyed the wireless aerials. Spare aerials were, however, soon rigged.

The Admiral Graf Spee made no attempt to follow the British cruisers, but continued to steam to the westward at a speed of about 22 knots.

After opening the range by steaming to the eastward under cover of a smoke screen for six minutes, Commodore Harwood again turned his ships to the westward and ordered them to take up positions for shadowing the enemy.

That the two small 6-inch gun cruisers had not suffered more severely in the close action was undoubtedly due to the speed and skill with which the ships were handled. The engine- and boiler-room personnel played a most important part in the action, steaming the ships at full power under difficult action conditions with the ships under almost constant use of helm. In the boiler-rooms, gun blast caused the flames to leap about a foot out of the fronts of the furnaces, yet the stokers, many of them youngsters, never paused in their work or moved back from the boilers.

THE THIRD PHASE.

The situation at 8 a.m. on December 18 was that the Admiral Graf Spee was continuing her flight to the westward ; H.M.S. Ajax was shadowing on the enemy's port quarter and H.M.S. Achilles on the enemy's starboard quarter, both cruisers being about 15 miles from the Admiral Graf Spee. H.M.S. Exeter was out of sight, drawing away to the south-eastward at slow speed.

At 8.7 a.m., and every hour thereafter, the British cruisers broadcast the position, course, and speed of the German raider, so that British merchant ships in the vicinity would keep out of danger.

Just before 9.15 a.m. H.M.S. Ajax recovered her aircraft. The conditions were difficult, but the operation was carried out with great skill and—what was so important—without loss of time.

Commodore Harwood's objective remained the destruction of the enemy in close action after nightfall, but he had to take steps to deal with the situation which might arise if the Admiral Graf Spee succeeded in eluding night action. He could not risk further prolonged day action with his superior adversary owing to the weakening of his force by the departure of H.M.S. Exeter and the quantity of ammunition remaining in his 6-inch gun cruisers. It was necessary, therefore, to secure reinforcements so that nothing should be left to chance. The nearest British warship was the 10,000-ton 8-inch gun cruiser H.M.S. Cumberland, at the Falkland Islands. At 9.46 a.m. Commodore Harwood ordered her to proceed to the River Plate area at full speed. H.M.S. Cumberland had, however, picked up jumbled messages which indicated that an action was in progress to the northward, and she had already left the Falkland Islands on the initiative of her commanding officer before these orders were received. On receipt of Commodore Harwood's signal H.M.S. Cumberland increased to full speed.

Meanwhile, other operations were set on foot by the Admiralty. Orders were given for the aircraft carrier H.M.S. Ark Royal and the battle cruiser H.M.S. Renown, and other ships all of which had been operating some

3,000 miles away, to proceed at once to the South American coast, and steps were taken to ensure that adequate supplies of fuel would be available at various strategic points.

By 10.5 a.m. H.M.S. Achilles, who had over-estimated the speed of the Admiral Graf Spee, had closed the range to $11\frac{1}{2}$ miles. The Admiral Graf Spee then altered course and fired two 8-gun salvoes of 11-inch at H.M.S. Achilles. The fact that the Admiral Graf Spee altered course sufficiently to bring her forward turret to bear in order to fire these salvoes suggests that the enemy's after 11-inch turret was out of action at that time. The first of these salvoes from the Admiral Graf Spee fell very short, but the second fell close to H.M.S. Achilles, which ship was already under helm. H.M.S. Achilles turned away at full speed under cover of a smoke screen and resumed shadowing from a longer range.

An hour later a merchant ship was sighted fairly close to the Admiral Graf Spee. She appeared to be stopped and blowing off steam. A few minutes later H.M.S. Ajax and H.M.S. Achilles received a signal from the Admiral Graf Spee. It read: "Ajax and Achilles from Admiral Graf Spee. Please pick up lifeboats of English steamer."

On coming up with the merchant ship H.M.S. Ajax found that she was the British s.s. Shakespeare, and that all her boats were hoisted. H.M.S. Ajax signalled to her asking if she required assistance, and the s.s. Shakespeare replied that she was quite all right and did not require assistance. It would appear, therefore, that the signal of the Admiral Graf Spee to H.M.S. Ajax was a ruse adopted by the German raider in an attempt to shake off her tenacious pursuers.

The shadowing of the Admiral Graf Spee by H.M.S. Ajax and H.M.S. Achilles continued without further incident until 7.15 p.m. At this time the Admiral Graf Spee altered course and re-opened fire on H.M.S. Ajax with her 11-inch guns at a range of 18 miles. H.M.S. Ajax at once turned away under cover of a smoke screen and resumed a shadowing position out of range.

By this time it was clear that the Admiral Graf Spee intended to enter the estuary of the River Plate.

The entrance to the River Plate estuary is guarded by a sandbank 16 miles long, running across the estuary. This is known as English Bank. Commodore Harwood considered that the Admiral Graf Spee might try to elude the British cruisers and break back to the open sea by doubling round this sandbank. He therefore disposed his forces so as to prevent the enemy slipping out. As soon as the Admiral Graf Spee passed the Island of Lobos, and was therefore committed to entering the estuary of the River Plate, the whole duty of shadowing the enemy devolved upon H.M.S. Achilles, while H.M.S. Ajax proceeded to the south of English Bank so that she would meet the Admiral Graf Spee if she tried to double back towards the open sea after rounding the sandbank.

The sun set at 8.48 p.m. and the Admiral Graf Spee was, from H.M.S. Achilles, clearly silhouetted at a range of about $12\frac{1}{2}$ miles. H.M.S. Achilles altered course to the north-westward in order to take full advantage of the afterglow. She had already increased speed in order to close the enemy before dark.

The enemy appeared to resent any shortening of the range by the British cruiser, and at 8.55 p.m. the Admiral Graf Spee altered course under cover of a smoke screen and opened fire at H.M.S. Achilles with 11-inch guns. H.M.S. Achilles at once replied to the German fire, turning

away at full speed as she did so, and laying a smoke screen to throw out the enemy's fire and cover her own movements. The Admiral Graf Spee ceased firing, and H.M.S. Achilles at once turned to the westward again at high speed in order to keep in touch.

At 9.26 p.m. the enemy again laid a smoke screen in an attempt to throw off the pursuit. This failed, and six minutes later the Admiral Graf Spee fired an 11-inch salvo at H.M.S. Achilles. H.M.S. Achilles at once made a large alteration of course to port in order to throw out the enemy's gunfire. On two other occasions, at 9.40 p.m. and at 9.43 p.m., the Admiral Graf Spee fired single salvos at H.M.S. Achilles. H.M.S. Achilles did not reply to these salvos. The loom of the land, now to the north-eastward of H.M.S. Achilles, must have made it very difficult for the enemy to see her, and it was considered that the flash of her guns would give away her position. It seemed clear that these sporadic salvos from the Admiral Graf Spee were merely attempts to drive off shadowers.

By 10.2 p.m. H.M.S. Achilles had closed to 5 miles from the Admiral Graf Spee, and it was possible to determine that the enemy was heading to pass to the northward of English Bank. H.M.S. Achilles informed H.M.S. Ajax accordingly.

Soon after that time H.M.S. Achilles found the Admiral Graf Spee very difficult to see owing to low clouds and patches of smoke. The British cruiser accordingly hauled to the southward in order to get the enemy silhouetted against the lights of Montevideo. This manœuvre was successful.

At 10.48 the Admiral Graf Spee was observed to be about 7 miles east of the Whistle buoy at the entrance to the Montevideo channel, and it was clear that the defeated German raider was about to seek the shelter of the neutral harbour of Montevideo.

Throughout the day and the three hours of darkness the shadowing action of the British cruisers had been entirely successful, and every attempt of the Admiral Graf Spee to elude or drive off her pursuers had been defeated.

The Admiral Graf Spee anchored in Montevideo roads at ten minutes past midnight.

THE FOURTH PHASE.

Commodore Harwood had called off the pursuit an hour before the Admiral Graf Spee anchored in Montevideo roads, since the enemy's intentions had been by that time clear, and the British Commander was at pains to respect neutral territorial waters.

New dispositions were at once taken up by the British cruisers. The Admiral Graf Spee might have taken refuge in Montevideo harbour, but there was no reason to suppose that she intended to remain there. It devolved upon the two small British cruisers to ensure that the German "pocket battleship" did not break out into the open sea, and it was clear that reinforcements could not reach Commodore Harwood for some time.

Nor were the geographical factors of the situation in Commodore Harwood's favour. The Estuary of the River Plate is 120 miles across from Cabo San Antonio, in the Argentine, to Punta del Este, on the Uruguayan coast. Out of the estuary there are three widely separated deep-water channels. The northernmost of these is between the English Bank lightship and Cumberland Shoal. The second deep-water channel, the centre of which lies 30 miles farther south, is between the south end

of English Bank and the north end of Rouen Bank—a large shoal approximately half-way between English Bank and the Argentine coast. Between Rouen Bank and the Argentine coast is the third deep-water channel, which is nearly 80 miles wide.

There were thus three widely separated routes by which the Admiral Graf Spee might break out to the open sea. Commodore Harwood had only two cruisers, and he could not hope to destroy the enemy unless they were concentrated.

There was a danger that the British ships might be surprised by their superior enemy in the dawn light, when the British cruisers would be silhouetted against the lightening eastern sky, while the Admiral Graf Spee would be invisible against the dark loom of the land and the offshore mists of dawn. The difficulties of the position were great, but Commodore Harwood had one vital advantage. One might expect the crews of ships which had undergone a fierce action in which they had suffered damage and casualties, and taken part in a long and arduous chase, to be in need of rest. This was not the case. The spirit of the *personnel* of the British cruisers was such that they showed no fatigue. It was the same spirit which animated Commodore Harwood, commanding a greatly inferior force in a dangerous and difficult situation, to begin the signal telling his ships of his intentions with the words "My object—destruction."

Commodore Harwood reviewed the difficulties with which he was faced and determined upon his course of action. The primary necessity was to keep to seaward of the Admiral Graf Spee if she put to sea and at the same time avoid being caught against the dawn light. He therefore ordered H.M.S. Ajax and H.M.S. Achilles to withdraw from the River Plate and patrol well to seaward during the night and to move back into the estuary after dawn.

The night passed without incident, and as soon as the danger of being silhouetted against the dawn light had passed, the ships closed in towards Montevideo, keeping constant watch over as much of the estuary as was possible.

At 10 p.m. on that day—Thursday, December 14—the 8-inch gun cruiser H.M.S. Cumberland arrived in the River Plate area, having made the long passage from the Falkland Islands in 34 hours. This reinforcement enabled Commodore Harwood to dispose his forces so that sectors to seaward of all three of the deep-water channels leading out of the River Plate Estuary could be watched during the night. H.M.S. Cumberland patrolled the centre sector, with H.M.S. Achilles to the north of her and H.M.S. Ajax to the southward. Should the Admiral Graf Spee come out, she was to be shadowed, and the three British cruisers were to concentrate sufficiently far to seaward to enable a concerted attack to be delivered on the enemy.

Next day—Friday, December 15—another problem faced Commodore Harwood. His ships could not keep the sea indefinitely, with boilers always ready to drive the ships at full speed, without further supplies of fuel. The Royal Fleet Auxiliary tanker Olynthus was in the vicinity, and H.M.S. Ajax was ordered to oil from her at sea, while the operation was covered by the other two cruisers. Fuelling at sea is a difficult operation in anything but a flat calm, and it was by no means calm. Securing wires, and even two spans of hurricane hawsers, were parted, but the fuelling was successfully accomplished.

Shortly after this, Commodore Harwood received news that the Admiral

Graf Spee had been granted an extension of her stay in Montevideo up to 72 hours, in order to make herself seaworthy. Nevertheless, Commodore Harwood's despatch states: "I could feel no security that she would not break out at any moment." The strain of watching and waiting, in instant readiness for action, could in no way be relaxed.

Before dawn on Saturday, December 16, H.M.S. Cumberland, H.M.S. Ajax, and H.M.S. Achilles concentrated in the southern part of the River Plate Estuary, and H.M.S. Ajax flew off her aircraft to carry out a reconnaissance. The pilot was told to be careful not to fly over territorial waters. The aircraft returned at 8.30 a.m. and reported that it had been impossible to see anything owing to bad visibility.

There was danger that the Admiral Graf Spee might take advantage of the mist and try to break out.

The British cruisers at once went to action stations and stood to the northward to intercept the enemy. Information was soon received, however, which indicated that the Admiral Graf Spee was still in Montevideo harbour, that she was repairing damage with assistance from the shore, and had provisioned. It was reported as unlikely that the Admiral Graf Spee would sail that night, but Commodore Harwood did not feel able to rely upon this report. The unceasing vigilance of the British cruisers continued and Commodore Harwood made a signal to his squadron informing the ships of his intentions in the event of the enemy breaking out during that night.

It was in the late afternoon of this day that Commodore Harwood received the Admiralty's signal informing him of the honours bestowed by His Majesty upon him and the Captains of H.M.S. Exeter, H.M.S. Ajax, and H.M.S. Achilles, and of his promotion to Rear-Admiral to date December 18—the date of the action and chase of the Admiral Graf Spee. Admiral Harwood's despatch states: "This was a most stimulating tonic to us all, and I took steps to pass it on to H.M. Ships under my command, emphasizing the share of all concerned in the honours which their senior officers had received."

The British squadron spent that night patrolling on a north and south line 5 miles to the east of the English Bank light buoy.

On the morning of Sunday, December 17, H.M.S. Achilles took in oil fuel at sea from the Royal Fleet Auxiliary tanker Olynthus while H.M.S. Cumberland and H.M.S. Ajax acted as a covering force for the operation.

The British squadron then cruised off the south-east of the English Bank, remaining concentrated and ready to take up the same night patrol as on the previous night.

That afternoon messages were received that the Admiral Graf Spee was preparing for sea. Admiral Harwood's despatch states: "We all expected that she would break out at any moment. I would like to place on record the fact that at this stage the most cheerful optimism pervaded all ships in spite of the fact that this was the fifth night of waiting for the enemy."

About 5.30 p.m. on the afternoon of Sunday, December 17, news was received by Admiral Harwood stating that the Admiral Graf Spee was weighing anchor. It seemed that the British expectations of action were to be fulfilled.

H.M.S. Cumberland, H.M.S. Ajax and H.M.S. Achilles at once altered course towards the entrance of the 5-mile dredged channel leading into Montevideo roads and the crews went to action stations. H.M.S. Ajax's aircraft was flown off, with orders to report the position and movements of

the Admiral Graf Spee and of the German ship Tacoma, to which ship the Admiral Graf Spee was known to have transferred a large number of men.

The Admiral Graf Spee left harbour at 6.15 p.m. and proceeded slowly down the dredged channel, after leaving the end of which she turned to the westward. The Tacoma also weighed anchor and followed the Admiral Graf Spee.

H.M.S. Ajax's aircraft reported the Admiral Graf Spee in a position in shallow water about 6 miles south-west of Montevideo, and shortly afterwards—at 8.54 p.m.—the aircraft signalled "Admiral Graf Spee has blown herself up."

The British cruisers carried on towards Montevideo, proceeding north of the English Bank. H.M.S. Ajax recovered her aircraft, and as she was doing so H.M.S. Achilles passed her. The two British cruisers which had done such excellent service cheered ship as they passed one another.

Navigation lights were switched on, and the British squadron steamed past the Whistle buoy at the entrance to the Montevideo dredged channel, passing within about 4 miles of the wreck of the Admiral Graf Spee. Admiral Harwood's despatch states: "It was now dark, and she was ablaze from end to end, flames reaching almost as high as the top of the control tower, a magnificent and most cheering sight."

While H.M.S. Cumberland, H.M.S. Ajax and H.M.S. Achilles were witnessing the ignominious end of the ship which had been the pride of the German navy—which had represented Germany at the Coronation Review at Spithead, and which had carried Herr Hitler triumphantly to Memel—H.M.S. Exeter, who had contributed so gallantly to the Admiral Graf Spee's defeat, was at the Falkland Islands.

"I have the greatest pleasure in informing you of the very high standard of efficiency and courage that was displayed by all officers and men throughout the five days of the operation. . . . Within my own knowledge, and from the reports of the Commanding Officers, there are many stories of bravery, devotion to duty, and of the utmost efficiency, which show that H.M. Ships have been forcefully trained and made thoroughly ready to deal with the many and various exigencies of battle. I am submitting separately a list of officers and ratings whom I consider to be especially deserving of award. I would remark, however, that the standard throughout has been so high that the preparation of this list has been very difficult.

"I would like also to place on record the honour and pleasure I had in taking one of H.M. Ships of the New Zealand Division into action, and fully concur with the Commanding Officer of H.M.S. Achilles' remark that 'New Zealand has every reason to be proud of her seamen during their baptism of fire.'

"Further, it is most satisfactory for me to be able to inform you that the machinery and equipment of H.M. Ships proved to be of the highest efficiency, and well able to stand up to the prolonged strain of battle.

"The main impression left on my mind is of the adequacy of our peace training. Little that had not been practised occurred, particularly among the repair parties."—*Admiral Harwood's despatch.*

REFERENCE SECTION

DIMENSIONS AND PARTICULARS OF BRITISH AND FOREIGN WARSHIPS.

Warships are arranged in classes, except in some instances where they are arranged alphabetically. The following abbreviations are used throughout the List:—

a.g.b. Armoured gunboat.	s.c. Seaplane carrier.
g.b. Gunboat.	n.n.s. Harvey nickel steel.
b. Battleship.	n.s. Harveyised or similar hard-faced steel.
b.c. Battle cruiser.	k.s. Krupp steel.
l.cr. Light cruiser.	t. Speed and H.P. at trials (in speed and H.P. columns).
c.d.s. Coast-defence ship.	b.p. Length of ship between perpendiculars.
M.Cr. Minelaying cruiser.	
cr. Cruiser.	
A.A. or H.A. Anti-aircraft guns.	
A.C. Aircraft carrier.	
A.T. Aircraft tender.	
L. Light guns under 15 cwt., including boats' guns.	
M. Machine guns.	
m.p.p. Multiple pom poms.	

Torpedo Tubes: (D.) = double; (T.) = triple; (Q.) = quadruple; (sub.) = submerged; a.w. = above water.

The following abbreviations are used to distinguish the various types of boilers:—

W.T. Water-tube boilers, where the type is not known.	I. Indret.
A. Ansaldo.	K. Kanpon.
B. Belleville.	My. Miyabara.
Bl. Blechynden.	Nic. Niclausse.
B. & W. Babcock and Wilcox.	Pen. Penhoet.
D'A. D'Allest.	T. Thornycroft.
G. Guyot.	T.S. Thornycroft-Schulz.
	W.F. White-Forster.
Y. Yarrow.	

The following abbreviations distinguish types of machinery:—

P.T. Parsons turbines.	tur. Turbines, where the type is not known.
C.T. Curtis turbines.	
B.C.T. Brown-Curtis turbines.	R. Steam reciprocating engines.
(G.) Geared turbines.	I.C. Internal combustion engines.
D. Diesel.	W.G.T. Westinghouse geared turbines.
Rat. Rateau.	

In later pages (marked P1, P2, etc., towards the end of the volume) plans of most of the ships appear.

Unless otherwise stated, the displacements are Standard displacements (*i.e.* excluding fuel and reserve feed water).

GREAT BRITAIN.—Battleships and Battle Cruisers.

Class	NAME.	Standard Displacement.	(Extreme.) Length.	Beam (Extreme.)	Normal Draught.	Horse-Power. Type of Boilers.	Where Built.	Makers of Engines. Type of Machinery.	Date of Launch.	Cost.	Armour.					Armament.		Speed.	Complement (War).		
											Belt.	Deck.	Side above Belt.	Bulkhead.	Heavy Guns.	Second-ary.	Guns.			Torpedo Tubes.	
b.	1 Battleship	40,000	789	30 0	30 0		J. Brown Fairfield	J. Brown Fairfield	Bdg.		in.	in.	in.	in.	in.	in.	16-in. guns.		knots		
b.	1 Battleship																				
b.	Lion . . .	40,000	789	30 0	30 0		Vickers (Walker) Cammell Laird	Vickers (Walker) Cammell Laird	Bdg.		in.	in.	in.	in.	in.	in.	16-in. guns.				
b.	Temeraire . .																				
b.	King George V.	35,000	745	103 0	28 0		Vickers (Walker)	Vickers (Walker) (G.)	1939	1941	in.	in.	in.	in.	in.	in.	10 14-in., 16 5.25-in.; 5 m.p.p.; aircraft and catapult.	Nil			
b.	Duke of York																				
b.	Howe . . .	33,950	106 1	106 1	106 1	45,000	Fairfield	Fairfield (G.)	Bdg.		14	6½	..	..	16-9	..	9 16-in., 12 6-in., 6 4.7-in. A.A.; 6 2-pr. mult. (sub.) p.p.; 5 m.; 11 L.; 2 24" 2-pr. Pom Poms in Nelson.	2	23	1360
b.	Anson . . .																				
b.	Nelson . . .	33,950	106 1	106 1	106 1	45,000	Swan Hunter	Walleand (G.)	1925	1927	6,410,071	in.	in.	in.	in.	in.	8 15-in., 12 6-in., 4 3-pr., 2 2-pr. m.p.p.; 8 4-in. A.A.; 5 m.; 11 L. Resolution has a catapult on X turret and carries 1 aircraft.	2	23½	1104	
b.	Rodney . . .																				
b.	Ramillies . . .	29,150	101 5	101 5	101 5	40,000	Dalmuir	Beardmore, P.T.	1916	1917	2,295,810	in.	in.	in.	in.	in.	8 15-in., 12 6-in., 4 3-pr., 2 2-pr. m.p.p.; 8 4-in. A.A.; 5 m.; 11 L. Resolution has a catapult on X turret and carries 1 aircraft.	2	23½	1104	
b.	Resolution . . .																				
b.	Revenge . . .	29,150	101 5	101 5	101 5	40,000	Barrow	Vickers P.T.	1915	1916	2,406,368	13-4	4-1	6	6-4	11	6	8 15-in., 12 6-in., 4 3-pr., 2 2-pr. m.p.p.; 8 4-in. A.A.; 5 m.; 11 L. Resolution has a catapult on X turret and carries 1 aircraft.	2	23½	1104
b.	Royal Sovereign																				

b	Malaya†	31,100 640‡ 104 0	31 3	75,000 B. & W.	Walker	Walleend . P.T.	1915 1916 2,945,709	13-6	3-1	6	4-2	11	6	8 15-in., 12 6-in., 8 4-in. A.A., 4 8-pr., 2 2-pr. m.p.p.; 5 M.; 11 L.; 1 catapult, 1 aircraft.	25||	1186
b.	Valiant	31,100 639‡ 104 † 0 31 3	75,000 B. & W.	Govan	Fairfield B.C.T.	1914 1916 2,537,087	13-6	3-1	6	4-2	11	6	8 15-in., 8 6-in., 4 3-pr., 4 4-in. A.A.; 2 2-pr. m.p.p.; 4 M.; 11 L.; 1 catapult, 1 aircraft.	25||	1186	
b.	Queen Elisabeth	31,100 644‡ 104 0	31 3	75,000 B. & W.	Portsmouth	Walleend . P.T.	1913 1915 2,478,103	13-4	3-1	6	4-2	11	6	8 15-in., 8 6-in., 4 2-pr., m.p.p.; 8 4-in. A.A.; 5 M.; 11 L.	25||	1187
b.	Warspite	30,600 644‡ 104 † 0 28 2	75,000 Y.	Devonport	Hawthorn P.T.	1913 1915 2,518,360	13-6	3-1	6	4-2	11	6	8 15-in., 8 6-in., 4 2-pr. (sub.) m.p.p.; 8 4-in. A.A.; 5 M.; 11 L.; 1 catapult, 1 aircraft.	25||	1180	
b.c.	Renown*	32,000 794‡ 102 4	31 0	120,000	Govan	Fairfield . B.C.T.	1916 1916 3,117,204	9-3 K.C.	2	6-3	4-3	11-7 K.O.	6 K.O.	6 15-in.; 20-4.5-in. A.A.; 5 M.; 11 L.; catapult (sub.) and 4 aircraft.	31-5||	1188

† Over rubbers.

|| Speed without bulges.

* Renown modernised (1939), including re-engining.

† Built at the charge of the Federated Malay States.

GREAT BRITAIN.—Aircraft Carriers.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Extreme breadth under water over rubbers.	Draft.	Horse-Power. Type of Boiler.	Where Built.	Maker of Engines. Type of Machinery.	Date of Launch.	Date of Completion.	Cost.	Armour.			Armament.		Speed.	Complement (War).
												Belt.	Deck.	Gun Position.	Guns.	Torpedo Tubes.		
A.C.	Indefatigable	tons.	ft.	ft. ins.	ft. ins.		J. Brown	J. Brown	Bldg.		£	in.		in.	4.5-in. guns		knots.	
A.C.	Implacable	23,000	760	95 9	22 4		Fairfield	Fairfield	Bldg.									
A.C.	Illustrious						Vickers (Barrow)	Vickers (Barrow)	1939	1940								
A.C.	Victorious						Vickers (Walker)	Wallsend	1939	1941					16 4.5-in. guns; 20 smaller		30½	
A.C.	Formidable	23,000	740	95 9	22 4	111,000	Harland & Wolff (Belfast)	Harland & Wolff	1939	1940								
A.C.	Indomitable						Vickers (Barrow)	Vickers	1940									
A.C.	Argus II	14,000	567	75 9	21 0	20,000	Dalmuir.	Beardmore P.T.	1917	1918	Purchased under construction	..	..	..	4 3-pr., 4 M., 10 L., accommodates 20 aircraft	—	20.2	420
A.C.	Eagle, ex-Almirante Cochrane.	22,600	667½	105 2	21 11	50,000	Walker (Armstrong)	J. Brown B.C.T.	1918	1924	As a battle-ship.	..	..	..	9 6-in., 4 4-in. A.A., 2 3-pr. m.p.p.; 32 smaller, 20 aircraft	—	24	753

A.C.	Furious	22,450	786½	90½	1	21	6	90,000	Walker (Armstrong) Y.	Wallsend Eng'g Co. B.C.T.(G.)	1916 As a cruiser.	1925 As an aircraft carrier.	2,486,603(a)	3	7	12 4-in. A.A., 4 2-pr., m.p.p.; 46 smaller, 33 aircraft	31	728
A.C.	Hermes	10,850	600	70	3	18	7	40,000	Elswick	Parsons Co. P.T.(G.)	1919	1924	2,030,263‡	..	..	6 5.5-in., 3 4-in. A.A., 2 2-pr. Pom Poms, 4 m., 16 L., 15 air- craft	25	551
S.C.	Pegasus* (ex-Ark Royal)	6900	366	50	10	17	6	3000	Blyth	Blyth S. B. Co. recip. Sydney	1914	1914	Purchased under con- struction	..	..	4 47-in. A.A., 4 2-pr. Pom Poms, 4 8-pr. 4 m.; 20 L.; 9 sea- planes	11	189
S.C.	Albatross ¶	4800	443½	61	0	15	6	12,000	Cookatoo Island (a)		1928	1929	268,796				21	350

* Used for experimental work.
¶ Used as a training carrier.

‡ Estimated cost including guns.
(a) First cost of ship as a cruiser.

§ Over rubbers; 120 ft. over pallisades.
¶ Transferred from Royal Australian Navy.

GREAT BRITAIN.—Cruisers.

Class.	NAME.	Standard Displacement.	Length. (Extreme).	Beam. (Extreme).	Draft.	Horse-Power. Type of Machinery	Where Built.	Maker of Engines.	Date of Launch.	Date of Completion.	Cost.	Armour.		Armament.		Speed.	Complement (War).
												Belt.	Deck.	Guns.	Torpedo Tubes.		
Norfolk Class	Dorsetshire .	9975	633	66 0	17 0	80,000 (G.)	Ports-mouth Fairfield	Cammell Laird	1929	1930	2,101,951	in.	in.	8 8-in., 8 4-in. A.A., 4 3-pr., 2 2-pr., 2 Pom Poms, 2 M., 10 L., 1 aircraft, 1 catapult.	8 21" (Q.)	32½	710
	Norfolk .	9925					Fairfield	Fairfield	1928	1930	2,141,961	..	..				685
York Class	Exeter .	8390	575	58 0	17 0	80,000 (G.) Y.	Devonp't	Parsons	1929	1931	1,837,415*	..	..	6 8-in., 4 4-in. A.A., 4 3-pr., 6 M., 8 L., 2 aircraft.	6 21" (Q.)	32	630
London Class	Shropshire .	9830	633	66 0	17 0	80,000	Dalmuir	Beardmore	1928	1929	1,941,950†	..	..	8 8-in., 8 4-in. A.A., 4 3-pr., 4 M., 10 L., 1 aircraft, 1 catapult.	8 21" (Q.)	32½	685
	Sussex .	9830	633	66 0	17 0	11(G.)	Hawthorn	Leslie	1928	1929	1,975,800†	..	..		
	Devonshire .	9850	630	66 0	17 0		Devonp't	Vickers	1927	1929	2,007,275	..	..		
	London .	9850	630	66 0	17 0		Ports-mouth	Fairfield	1927	1929	1,966,559	..	..		
Kent Class	Suffolk						Ports-mouth	Parsons	1926	1928	2,180,240†	..	..	8 8-in., 8 4-in. A.A., 4 3-pr., 4 2-pr. Pom Poms, 4 M., 8 L., 3 aircraft	Nil	31½	700
	Berwick						Govan	Fairfield	1926	1928	2,029,526	..	..		
	Cornwall	10,000	630	63 4	15 7	80,000 (G.)	Devonp't	Beardmore	1926	1928	1,252,110*	..	..	Cumberland and Suffolk, 6 4-in. A.A., Kent, 1 aircraft.			
	Cumberland .						Barrow	Vickers	1926	1928	2,960,821*	..	..		
Improved Southampton Class	Kent					Y.	Chatham	Hawthorn	1926	1928	2,084,213†	..	..		
	Edinburgh						Swan	Wallsend			2,162,504†	..	..		
		10,000	613½	63 4	17 3	80,000 (G.T.)	Hunter	Harland & Wolff	1938	1939	2,176,731†	..	..	12 6-in., 12 4-in. A.A., 20 smaller 3 aircraft, 1 catapult.	6 21" (Q.)	32½	..
	Belfast .						Harland & Wolff	Harland & Wolff				..	..		

GREAT BRITAIN.—Cruisers, &c.—continued.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam. (Extreme.)	Draught.	Horse-Power. Type of Machinery.	Where Built.	Maker of Engines	Date of Launch.	Date of Completion.	Cost.	Armour.		Armament.	Torped. Tubes.	Speed.	Complement (War).
												Belt.	Deck.				
E Class	Emerald	7550	570	54 7	16 8	80,000 B.C. (G.) Y.	Armstrong	Wallsend.	1920	1926	1,617,120	in. 9-1½	in.	7 6-in., 3 4-in. A.A., 4 3-pr., 2 2-pr. Pom Poms, 2 M., 8 L., 1 aircraft.	16 21*	33	577
	Enterprise	7580		54 9			J. Brown	J. Brown.	1919	1926	1,690,658*	1	..				
D Class	Diomedé						Vickers.	Vickers	1919	1922	1,146,904						
	Despatch						Fairfield.	Fairfield	1919	1922	1,016,870						
	Durban						Scotts	Scotts	1919	1921	954,667						
	Delhi	4850	471½—472½	46 3—46 9	14 3	340,000 (G.) Y.	Armstrong	Wallsend.	1918	1919	785,145	3	Shields	6 6-in., 3 4-in. A.A., 2 M., 4 3-pr., 8 L., 2 2-pr. Pom Poms.	12 21*	29	460
Hawkins Class	Danaë						Armstrong	Wallsend.	1918	1918	701,600						
	Dauntless						Palmer	Palmer	1918	1918	750,025						
	Dragon						Scotts	Scotts	1917	1918	690,083						
Hawkins Class	Frobisher	9860	605	65 1	17 3	65,000	Devonport.	Wallsend	1920	1924	2,035,915+	3	Shields	5 4-in. H.A., 4 3-pr., 2 2-pr., 2 M., 8 L.	4 21"	30½ 29½	715 747
	Hawkins	9800		65 1		55,000 (G.) Y.	Chatham	Parsons	1917	1919	1,599,741						
Carlisle Class	Cairo						Cammell	Cammell	1918	1919	787,479						
	Capetown						Laird	Laird	1919	1922	984,720	3	..	8 4-in. A.A., 1 2-pr. m.p.p., 10 smaller.	8	29	415
	Colombo	4200	451½	43 10	14 1	40,000 (G.) Y.	Cammell	Cammell	1919	1922	984,720			5 6-in., 2 3-in. A.A., 4 3-pr., 2 2-pr. Pom Poms, 2 M., 8 L.	21*		
	Carlisle						Fairfield.	Fairfield	1918	1919	692,308			8 4-in. A.A., 1 2-pr. m.p.p.			
	Carlisle						Fairfield.	Fairfield	1918	1918	669,216						

Ceres Class	Cardiff . . .	4290	450	43	9	14	1	40,000 (G.) Y.	Fairfield J. Brown	1917	1917	543,507	8	5 6-in., 2 8-in. A.A., 4 3-pr., 2 2-pr. Pom Poms; 2 m., 8 L.	29	430
	Ceres . . .	4290	450	43	9	14	1	40,000 (G.) Y.	J. Brown	1917	1917	529,248	21"	8 L.	29	430
	Curacao II . .	4290	450	43	9	14	1	40,000 (G.) Y.	Beardmore	1917	1917	794,201	8	8 4-in. A.A., 1 m.p.p., 2 m.e., 8 Lewis.	29	430
	Coventry II . .	4290	450	43	9	14	1	40,000 (G.) Y.	Swan Hunter	1917	1917	586,182	21"	8 L.	29	430
Caledon Class	Caledon . . .	4180	450	43	1	14	1	40,000 P.T. (G.) Y.	Cammell Laird	1916	1917	547,900	8	5 6-in., 2 8-in. A.A., 4 3-pr., 2 2-pr. Pom Poms; 2 m., 8 L.	29	420
	Caradoc . . .	4180	450	43	1	14	1	40,000 P.T. (G.) Y.	Scotts	1916	1917	534,583	21"	8 L.	29	420
Leander Class	Achilles . . .	7030	554	55	8	16	2	072,000	Cammell Laird	1932	1933	..	8	8 6-in., 4 4-in. A.A., (Leander, 8 4-in. A.A.), 1 aircraft	32½	570
	Leander . . .	7270	554	55	2	16	2	072,000	Devonport Vickers	1931	1933	1,667,819	21"	8 6-in., 4 4-in. A.A., (Leander, 8 4-in. A.A.), 1 aircraft	32½	570
Dido Class	Charybdis . . .	5450	..	..	..	..	..	..	Cammell Laird	Bldg.	..	..	..	10 5.25-in., 1 cata-pult, 1 aircraft.	33	..
	Cleopatra . . .	5450	..	..	..	..	..	..	Hawthorn	1939	1940	..	6	..	..	..
	Scylla . . .	5450	..	..	..	..	..	..	Scotts	1939	1940	..	21"	..	..	..
	Dido . . .	5450	..	..	..	..	..	..	Cammell Laird	1939	1940	..	..	..	..	..
	Euryalus . . .	5450	..	..	..	..	..	..	Chatham Hawthorn	1939	1941	..	..	..	..	..
	Naiad . . .	5450	..	..	..	..	..	..	Hawthorn	1939	1940	..	..	..	..	..
Hawkins Class	Phoebe . . .	9100	605	65	2	17	3	25,000 T.G.	Fairfield	1918	1918	1,671,712	3	2 4.7-in., 4 3-pr., 1 2-pr. Pom Poms; 2 m., 8 L.	20	720
	Sirius . . .	9100	605	65	2	17	3	25,000 T.G.	Scotts	1918	1918	1,671,712	..	..	..	..
M. Cr. Class	Hermione . . .	6740	539	59	0	14	5	40,000 Tur. & Diesel	mouth Stephen	1924	1927	1,246,083	..	4 4.7-in. A.A., 4 3-pr., 4 2-pr. Pom Poms; 4 m., 8 L., 310 mines	28	700
	Vindictive ‡ . .	6740	539	59	0	14	5	40,000 Tur. & Diesel	Stephen	1924	1927	1,246,083	..	..	..	..
M. Cr. Class	Adventure . . .	6740	539	59	0	14	5	40,000 Tur. & Diesel	Harland & Wolff	1924	1927	1,246,083	..	..	..	..
	Adventure . . .	6740	539	59	0	14	5	40,000 Tur. & Diesel	Devonport	1924	1927	1,246,083	..	..	..	..

* Total estimated cost of ship, including guns,

‡ Vindictive is demilitarised and employed as a cadets' training ship.

Anti-aircraft ship.

§ Being converted to anti-aircraft ship.

GREAT BRITAIN.—Miscellaneous Craft.

Gunnery Drill Ship (ex-Monitor).—Marshal Soult, 6,400 tons, 2 15-in. guns, 2 3-in. H.A. guns.
Destroyer Depot Ships.—Greenwich (1916), 8,100 tons, 2 4-in. guns, 2 3-in. A.A.; Woolwich (1935), 8,750 tons, 15 knots, 4 4-in. A.A. Tyne and Hecla (1941) 11,000 tons, 8 4.5-in. A.A., 22-pr. w.p., 7,500 S.H.P., 17 knots.
Submarine Depot Ships.—Lucia, 5,800 tons, 14.5 knots; Cyclops, 11,300 tons, 13 knots; Medway (Vickers', 1929), displacement 14,650 tons, speed 15 knots, armament 2 4-in., 4 4-in. A.A., 4 3-pr. Maidstone (1938) and FORTH (1939), 8,900 tons, 17 knots, 8 4.5-in., 4 3-pr. Adamant, building.
Repair Ship.—Resource (Vickers', 1930), 12,300 tons, 15 knots, armament 4 4-in. A.A.
Minelayers (ex-Monitors). 1915.—Medusa, Melpomene, Minerva, 355 tons, 10 knots, 52 mines (ex-trawlers); Linnet, 498 tons, 10½ knots; Plover, 805 tons, 14½ knots. Redstart and Ringdove (as Linnet). Abdiel, Manxman, Weikman (1941), 2,650 tons, 40 knots, 6 4-in.
Surveying Vessels.—Endeavour, 1,280 tons, 13 knots, 1 3-pr.; Challenger, 1,140 tons, 1,200 H.P. (recip.), 12½ knots; Franklin, 830 tons, 17 knots, 1 3-pr. Scott (1930), 815 tons, 17 knots, 1 12-pr. A.A.
Non-magnetic Survey Vessel.—Research, building by Philip at Dartmouth. Sailing vessel, 160 B.H.P., 770 tons, 6½ knots.
Netlayer and Target Towing Vessels.—Guardian (Chatham, 1931-3), 2,860 tons, 6,500 H.P., 18 knots, 2 4-in. A.A. Protector (1934 programme), 2,900 tons, 20 knots, 1 4-in.
Mining School (Vernon) Tender.—Nightingale (Portsmouth, 1931), Vernon (Portsmouth, 1932), displacement 275 tons, horse power 400, speed 10 knots, coal capacity 15 tons.
Boom Defence Vessels.—Bownet, Burgonet, Dragonet, Falconet, Magnet, Martinet, Planet, Plantagenet, Signet, Sonnet. 850 I.H.P., 1 3-in. Barbican Barquette, Barbican, Barbrook, Barcastle, Barcombe, Barcroft, Barnehurst, Barfair, Barfield, Barlane, Barlow, Barnmouth, Barrage, Barranca, Barricade, Barrier. 730 tons, 850 I.H.P., 11½ knots, 1 3-in. Dunnet 350 tons, 350 I.H.P., 10 knots, 1 3-in. Quannet. Moorgate, 345 tons, 1 3-in. Aldgate, Bishopsgate, Dowgate, Ludgate, Watergate, 290 tons, 1 3-in. (these vessels are not self-propelled).
Tenders.—(For Submarine depot, Portland), Elfin (1933), 222 tons, 250 H.P., 94 knots. (For Torpedo School) Redwing (1933), 225 tons, 250 H.P., 9½ knots.
Gunnery Training Ship.—Battleship Iron Duke has been de-militarised under the London Treaty and converted to a Gunnery Training Ship (1931-32).
Fleet Target Ship.—Centurion (ex-battleship), 25,500 tons.
Trawlers.—Basset (1935), 460 tons, 1 4-in. gun; Blackwater, Foyle and Boyne (War built), 400-500 tons; Lilac, Laurel, Holly, Hawthorn, Cedar, Cypress, Sycamore, Syringa, Magnolia, Willow, 570-600 tons, 1 4-in. gun; Turquoise, Topaze, Sapphire, Jasper, Cornelian Pearl, Ruby, purchased in 1935, 580-640 tons, 1 4-in. gun. Colne, Deon, Dee, Garry, Kennet, Liffey, 10½ knots, 1 12-pr. Redwood, Oak, Maple, Larch, Hornbeam, Berberis, Alder, 300-600 Tons. Arctic Ranger, Bedfordshire, Bengali, Brontes. Cambridgeshire, Cape Argona, Cape Cormorin, Darceman, Davy, Derby County, Drangeg, Huddersfield Town, Istria, Kelt, Kingston Andalusite, Kingston Chrysolite, Kingston Olivine, Kirkella, Lady Beryl, Lady Elisa, Leeds United, Leyland, Loch Melfort, Loch Tulla, Lord Hotham, Lord Lloyd, Lord Plender, Lord Wakefield, Man o' War, Pilot, Regal, Saon, Sindonia Spanish, Spurs, Stafnes, Stella Capella, Thornwick Bay, Turcoman, Vascama, Victorian, Wellard, 4 in No. Trawlers building in Portugal. Lady Shirley (1937), 472 tons, 1 4-in., 2 M.
Cable Vessels.—Lasso, 910 tons, 1100 I.H.P., 13 knots; Kilnurn, 700 I.H.P., 10 knots.
Motor Torpedo Boats.—Nos. 6-12 and 14-18 are of the same design, 60 ft. long, 18 tons, 1,500 B.H.P., 35 knots, 8 small guns, 2 torpedoes. M.T.B. No. 22 70 ft., 32 tons, 3650 B.H.P., 40 knots, 2 torpedoes. No. 100 (ex-m.m.s. 51). M.T.B. 101, 67 ft., 22 tons, 2 torpedoes. M.T.B. 102, 68 ft., 28 tons, 3000 B.H.P., 44-48 knots, 2 21-in. torpedoes. Bloodhound, 35 tons, 2 lengths, 68 ft.; beam, 19 ft.; 25 knots.
Motor Minesweepers.—Nos. 1 and 2, 52 tons, 1,500 H.P., 15 knots.
Auxiliaries.—Tugs, Drifters, Hospital Ship (Maine, 10,100 tons), Oilers, Store ships, Mooring lighters, etc.
Monitors.—Erebus 7,200 tons, 12 knots, 2 16-in., 8 4-in., 2 8-in. A.A. 12 smaller guns.
Fleet Air Arm Supply and Depot Ship.—Unicorn, building.
Hospital Ships.—Dinard and St. Julien.

For destroyers, submarines, sloops, corvettes, minesweepers and river gunboats, see *Fleetilla tables*.

Defence Forces of the Dominions.

ROYAL AUSTRALIAN NAVY.

Under Control of the Australian Naval Board.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam. (Extreme.)	Draught.	Horse-Power.	Type of Machinery and Boilers.	Where Built.	Maker of Engines.	Date of Launch.	Date of Completion.	Cost.	Armour.			Armament.		Speed.	Complement (War).
													Belt.	Deck.	Gun Position.	Guns.	Torpedo Tubes.		
Kent Class Cruisers	Australia.	9870 tons.	630	68 4	16 3	80,000	B.C. (G.)	Brown	Brown	1927	1928	..	in.	..	..	8 8-in., 8 4-in. A.A., 4 8-pr., 4 2-pr. m.p.p., 4 m., 12 L., 1 a.w. aircraft, 1 catapult.	8 21" a.w.	31½	685
	Canberra.	9850						Clydebank									(Q.)		
Modified Leander Class	Hobart (late Apollo)	7000	562	56 8	15 8	72,000	P.T. (G.)	Devonport	Beardmore	1934	1936	1,459,117*	..	..	..	8 6-in., 8 4-in. A.A., 18 smaller, 1 catapult, 2 aircraft	8 21"	32½	590
	Perth (late Amphion)	7100	560	56 8	15 8			Portsmouth	Beardmore	1934	1936	1,506,668.	..	..	..	
Adelaide Type Cruiser	Adelaide.	5100	462½	50 1	15 10	25,000	P.T. (G.)	Sydney	Sydney	1918	1922	..	3	—	..	8 6-in., 3 4-in. A.A., 8 8-pr., 8 L., 2 m.	2 (sub.) 21"	25.5	450
	Stuart.	1580	332½	31 9	12 3	40,000	Y.	Hebburn	Hawthorn Leslie	1918	1918	—	—	—	—	5 4.7-in., 1 3-in. A.A., 7 m. & L.	6	36½	183
Flotilla Leader	Arunta																		
Tribal Class Destroyers	Warramunga and others	1870	..	36 6	..	..	..	..	..	bldg.	..	{ 500,000 approx.	..	..	..	8 4.7-in., 7 smaller	4 21"	36½	200

DESTROYERS.—"V" Class :—Vampire, Vendetta, Voyager. Completed, 1917-18; Displacement, 1,090 tons; 27,000 H.P.; speed, 34 knots; armament, four 4-in.; 6 smaller guns, 6 torpedo tubes.

SLOOP.—Yarra (1935), 1060 tons, 2000 H.P. (T.G.), 16½ knots, 8 4-in., 4 8-pr., and Swan (1936). Parramatta and Warrego (1940), repeat vessels.

SURVEYING VESSEL.—Moreaby (late Silvio) (1918), 1650 tons, length 267½ ft., 2,500 H.P., 15 knots, one 8-pr.

DEPOT AND FLEET REPAIR SHIP.—Penguin (late Platypus) (J. Brown, Clydebank, 1917). Displacement 3455 tons, 14 knots, 1 4-in.

BOOM DEFENCE VESSELS.—Kookaburra, 523 tons, 9½ knots, 1 12-pr. A.A. Koala, Kangaroo, building.

MINESWEEPERS.—50 in number, building.

* Total cost, including guns and aircraft.

NEW ZEALAND DIVISION OF ROYAL NAVY.

Under the control of New Zealand Naval Board.

TRAINING AND DEPORT SHIP.—Philomel (2570 tons); 1 6-in., 1 4-in. 2 12-pr. TRAWLER.—Watakura.
The CRUISERS Achilles and Leander, the SLOOPs Leith and Wellington and the SURVEYING VESSEL Endeavour are allocated to the station.

ROYAL CANADIAN NAVY.

Under control of the Canadian Department of National Defence.

DESTROYERS.—St. Laurent (ex-Cygnat, Vickers 1932), Restigouche (ex-Comet, Portsmouth 1931) and Ottawa (ex-Crusader, Portsmouth 1931) 1375 tons, 36 knots, 36,000 S.H.P.; 4 4.7-in., 7 smaller, 2 quadruple 21-in. torpedo tubes. Saguenay and Skeena (Thornycroft, 1931) 1337 tons, 32,000 S.H.P., 35 knots, 4 4.7-in., 2 2-pdr., 2 quadruple 21-in. torpedo tubes; Assiniboine (ex-Kempenfelt, J. S. White, 1937) 1390 tons, 36,000 S.H.P., 35.5 knots, 4 4.7-in., 2 2-pdr., 8 21-in. torpedo tubes. Ex-U.S.N. Town Class: St. Croix and St. Francis (1919) 1190 tons, 35 knots, 4 4-in., 1 3-in., 12 21-in. torpedo tubes; Hamilton, Niagara, Columbia, Annapolis and St. Clair (1918-1920) 1060 tons, 35 knots, 4 4-in., 1 3-in., 12 21-in. torpedo tubes. 2 Tribal Class, building in Canada, 1870 tons, 36.5 knots, 8 4.7-in., 7 smaller, 4 21-in. torpedo tubes. MOTOR TORPEDO BOATS.—15 in number, 70-ft. long, 4,350 B.H.P.

CORVETTES.—80 building.

MINESWEEPERS.—60 building. 12 special type, building.

PATROL VESSELS.—24 building.

MINESWEEPING TRAWLERS.—Armentières (1918) 360 tons, 10 knots; Comox, Nootka, Gaspe and Fundy (1938) 688 tons, 12½ knots, 1 4-in. ARMED MERCHANT CRUISERS.—3 in number.

SOUTH AFRICA.

[A number of M.T.Bs., MINESWEEPERS and other small craft.]

ROYAL INDIAN NAVY.

MINESWEEPING SLOOPs.—Indus (1935) 1,190 tons; 2,000 H.P.; 16½ knots; 2 4.7-in., 4 3-pr., 11 smaller guns. Hindustan (1930), 1,190 tons; 2,000 H.P.; 16½ knots; 2 4-in., 4 3-pr., 10 smaller guns. Clive, 1920, 2,021 tons; 1,700 H.P.; 14½ knots; 2 4-in. 2 2-pdr., 4 3-pdr. guns. Lawrence, 1918, 1,259 tons; 1,900 H.P.; 15 knots; 2 4-in., 4 3-pdr., 2 2-pdr. guns.

SLOOP.—Cornwallis (1917) 1,345 tons; 17 knots; 2,500 H.P.; 3 4-in., 2 2-pdr., 4 3-pdr. guns.

SURVEYING SHIP.—Investigator (1907), 1,172 tons; 1,137 H.P.; 13 knots; no guns.

TRAWLER.—Madras.

ARGENTINE REPUBLIC.

Class.	NAME.	Standard Displacement.	Length (Extreme).	Beam.	Draft.	Horse-Power. Type of Machinery.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour.					Armament.		Speed.	Fuel. Coal. Oil.	Complement.	
											Belt.	Deck.	Side above Belt.	Bulkhead.	Gun Position. Heavy Guns.	Second ary.	Guns.				Torpedo Tubes.
c.	La Argentina	6500 tons.	535 ft.	56 ft.	16 ft.	54,000 P.T. (G.) Y.	Vickers, Barrow	1937	1938	1,750,000 approx.	3 in.	3 in.	in.	in.	in.	in.	9 6-in., 4 4-in. A.A., 2 3-in., 25 A.A. M.G., 1 catapult, 2 aircraft.	6	30 knots.	1000 tons.	556 +80 Cds.
c.	Almirante Brown	6495	545½	58 ft.	16½	100,000 P.T. (G.) Y.	{ Genoa . . . Leghorn }	{ 1929 1931 }	1,250,000	3	1	..	..	2	2	6	7-5-in., 12 4-in. A.A., 6 Pom Poms, 1 catapult, 2 seaplanes.	2	32	1800	600
c.	Veinticinco de Mayo																				
c.d.s.	General Belgrano†	6100	328	59½	24	18,000 R. Y.	Leghorn	1897	1899	696,700	6-3 in.	1½	6 in.	6 in.	6 in.	6	2 10-in., 8 6-in., 4 6-pr.	—	20	1000	515
c.d.s.	Pueyrredon †	6100	328	59½	24	18,000 R. Y.	Sestri Ponente	1898	1901	782,000	6-3 in.	1½	6 in.	5 in.	6 in.	6	2 10-in., 8 6-in., 4 6-pr., 1 1-pr. A.A.	—	20	1000	480
b.	Moreno . . .	27,940	585	97½	28	45,000* C.T. (G.) B. & W.	{ Camden, N.J.) (N.Y.S.B.Co.) Quincy, Mass. }	{ 1911 1915 }	2,200,000	12-10-3-2 in.	9-6 in.	9	12-9 in.	6	12	19-in., 12 6-in., 4 8-in. A.A., 4 1-85-in., 6 M.	2 (enb.) 21"	22.5	—	1175	
	Rivadavia . . .																				4200

COAST DEFENCE SHIPS.—Libertad and Independencia, 2510 tons, 13 knots, completed at Birkenhead in 1891-93, and converted to oil fuel in 1927, carry two 9-4-in., four 4-7-in., four 3-pr. guns, 2 1.5-in. A.A.

RIVER GUNBOATS.—Parana and Rosario (Elswick, 1908), 1055 tons, two 6-in. howitzers, six 3-in., 2 L., 15 knots.

TRAINING-SHIP (cruiser).—Presidente Sarmiento (Birkenhead, 1896; refitted 1926), 2320 tons, 15 knots; four 4-7-in., four 6-pr., two 3-pr., 3 torpedo tubes.

SURVEYING VESSELS.—Comodoro Rivadavia, ex-San Juan, Bahia Blanca ex-San Luis (Hawthorn Leslie, Newcastle, 1928), 790 tons, 1-3-in. 12 knots, Alferez Mackinlay (1914), 783 tons, 10 knots. Escort Vessels.—Munire, King (building). 1000 tons, 4000 B.H.P., 16 knots.

Tugs.—Mataco, Toba (completed 1928, at Mesera. Hawthorn Leslie's, Newcastle), Azapardo (1919), Ona, Querandi (Thornycroft, 1914), and 9 others.

MINESWEEPERS.—Comodoro Py, Bouchard, Drummond, Granville, Parker, Robinson, Seaver, Fournier, and Spiro (1937-38); 550 tons; 2000 H.P.; 16 knots; two 3-9-in., two 2-9-in. guns; 5 ex-German Minesweepers; 17 knots; three 3-in. guns. 4 OILERS, 3 TRANSPORTS.

* Moreno and Rivadavia were converted to oil burning and fitted with geared turbines in 1928. † Converted to oil burning and armament altered in 1929.

For Destroyers and Submarines, see Flotilla Tables.

BRAZIL.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power. Type and Bolters.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour.						Armament.		Speed.	Coal Oil.	Complement.
											Belt.	Deck.	Side above Belt.	Bulkheads.	Heavy Guns.	Second-Ary.	Guns.	Torpedo Tubes.			
b.	Minas Geraes *	19,200	541	83	25	25,000 R.	Elswick	1909	1910	£ 1,821,400	9-6-4	2	9-6-4 K.S.	9	12-8 K.S.	9	12 12-in., 14 4-7 in., 4 3-in. A.A.; 2 3-pr., 4 1.5-in. M., 8 A.A. M.G.	—	21	Oil 850	
b.	São Paulo *					T.	Barrow	1908	1910		K.S.										
l.cr.	†Bahia . . .											1½	..	..	..	..	10 4-7-in., 4 3-pr.	4 21" (D)	27	— 450
l.cr.	†Rio Grande do Sul . . .	3150	401½	39	18½	22,000 B.C.T. (G.) T.	Elswick	1908	1910	..	..								

* Reconstructed and converted to oil fuel, 1934-39, 1937-46 respectively.

† Reconstructed, including conversion to oil fuel, at Rio de Janeiro, 1926.

MINELAYERS.—Cananea, Cabedelo, Camocim, Canavieiras, Caravelas, Carioca, 188½ feet, 552 tons, 2500 H.P., 14 knots, 1 4-in. gun, 50 mines. Itapemerim, 118 ft., 150 tons, 2 1-5-in., 30 mines.

RIVER MONITORS.—Pernambuco, 470 tons, 11 knots, built at Rio de Janeiro (1910), two 4-7-in., 2 3-pr. guns. 10 knots.

one 6-in. gun. Paraguassu, 430 tons, 146 feet, 1 4-7-in. gun., 13 knots. Oyapock (1907), 195 tons, 14 knots, two 3-pr., 2 m.

SUBMARINE TENDER.—Ceará (Spezia, 1916), 4000 tons, 4100 H.P., 14 knots, four 4-in., four 3-pr.

REPAIR SHIP.—Belmonte (ex-German SS, Valesia), 5227 tons gross, four 4-7-in. six 6-pr., 2700 H.P. 12 knots.

TRAINING SHIP.—Almirante Saldanha, Vickers' (1934). A four-masted schooner, 3325 tons, 305 feet over all, four 4-in. and one 3-in. A.A. guns, one 21-in. torpedo tube, 1400 B.H.P. aux., 12 knots.

SURVEY VESSELS.—Rio Branco, 835 tons, 15 knots, two 6-pr. Calheiros da Graca, Vital de Oliveira, Jose Bonifacio, 1300 tons, 9 knots, two 4-in., two 6-pr.,

Jacaguay, 800 tons, 16 knots.

5 Tugs, Tenders, 3 Tankers and River Craft.

For Destroyers and Submarines, see Flotilla Tables.

CHILE.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power. Type of Machinery.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour.					Armament.		Speed.	Fuel.		Complement.	
											Belt.	Deck.	Side above Belt.	Bulkhead.	Heavy Guns.	Second-ary.	Guns.		Torpedo Tubes.	Coal.		Oil.
b.	Almirante Latorre * (ex-H.M.S. Canada)	28,950 tons.	661 ft.	92 ft. 6 in.	6 ft. 29 in.	0 37,000 P.T. Y.	Elswick.	1913	1915	£ ..	in. 9-4	in. 4-2½	in. 4½	in. ..	in. 10	in. 6	10 14-in., 14 6-in., 4 4-in., A.A., & 1.8-in., 1 cata-pult.	4 (sub.) 21"	23 knots.	4300 —	1000 —	
c.	Blanco Encalada †	3435 tons.	870 ft.	46 ft.	6 ft. 19 in.	6 14,500	Elswick	1898	1894	..	..	4-1½	..	..	..	..	2 8-in., 8 6-in., 4 3-in.	2 18"	22-7	850	385	

* Fitted with bulges, converted to oil burning, and modernised in England (completed 1931).

† Training ship.

OUTRIGERS (Armstrongs, 1930)—Maipo, Rancagua, 3,080 tons displacement, two 4.7-in. guns. COASTGUARD VESSELS—Orompello, Ellicura, 530 tons; built 1919; 1400 I.H.P.; 14 knots; 2 3-in. guns. Sibbald, Yelcho, Micalvi, Condor, and Yanez. Two in number, 1,000 tons (building). SUBMARINE DEFORT SHIP—Araucano (Vickers-Armstrongs, Barrow), completed 1930; displacement 5,890 tons; armament two 4.7-in., two 3-in. A.A.; speed 18 knots; H.P. 2,500; 1 seaplane. Five tugs, 790 tons, 11 knots, 1 3-in. gun. Two tugs, 320 tons, 12 knots. Two towing launches. Two Cruisers projected, probably 10,000 tons, with 8-in. guns. Two tugs projected.

SURVEYING VESSEL.—Vidal Gormaz (ex-Jason), 700 tons, 13 knots.

TRANSPORT.—Angamos, 3,800 tons (building).

For Destroyers and Submarines, see Flotilla Tables.

DENMARK.*

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour.					Armament.		Speed.	Fuel.		Complement.	
											Belt.	Deck.	Side above Belt.	Bulkhead.	Gun Position.	Heavy Guns.	Second A.T.		Guns.	Torpedo Tubes.		Coal.	Oil.
cr.	Niels Juel†	3800 tons.	295	45.3	6.15	9	5500 R. Y.	Copenhagen	1918	1923	£ ..	8-4 in.	2	..	..	..	..	10.5-9-in., 2 2-4-in., 8 M.G., 10 .78-in. A.A.	2 (enb.) 18"	17-0	240	365
c.d.s.	Peder Skram	3500 tons.	286	7.51	6.16	8	5400 R. T.	Copenhagen	1908	1909	..	8-4 in.	2	..	..	7	6	29-4-in., 4 5-9-in., 8 3-in., 2 1-45-in., 4 7-8-in. M., 2 M.	4 (enb.) 18"	16-0	250	275

* Under the control of Germany.

† Modernised 1930.

MINELAYERS.—Løsen 640 tons, 12 knots, 23-in., 2 A.A. guns, 175 mines; Sixtus and Krivinus, 186 tons, 8 knots, 2 1-pr. guns, 60 mines. Steamboat A, 96 tons, 7 knots, 2 m.g. Lindormen (1941), 500 tons, 14 knots, 23-in.

MINESWEEPERS.—Springeren, Støren, Soridderen, Søhunden, Havhesten and Narhvalen, 110 tons, 24-3 knots, 2 2½-in. guns, 1 torpedo tube; Soloven, Sobjörnen, Soulvén, 270 tons, 18 knots, 23-in. Ex torpedo boats.

CORVETTES.—Hvalrosen, 169 tons, 26-3 knots, 13-in. gun, 4 18-in. torpedo tubes; Makrelen, Nordkaperen, Havkatten, and Seelen, 110 tons, 24-3 knots, 2 2½-in. guns, 4 18-in. torpedo tubes. Ex-torpedo boats.

SURVEYING VESSELS.—Hejmdal, 705 tons, 12½ knots, 23-in. guns, 4 71-in. A.A.; Ternen, 80 tons, 1 148-in. Freja (1940), 315 tons, 10 knots.

FISHERY PROTECTION VESSELS.—Ingolf, 1180 tons, 16½ knots, 2 47 in., 2 2½-in. guns, 1 aircraft; Hvidbjørnen, 1050 tons, 14½ knots, 2 3½-in. guns; Islands Falk, 730 tons, 13 knots, 23-in., 2 1½-in. guns; Beskytteren, 415 tons, 11 knots, 1 2½-in. gun; Maagen, 110 tons, 8 knots, 1 1½-in. gun; Agir, 500 tons, 14 knots, 2 6-pr.

DEPOT SHIPS.—Hakla, Grønsund, Fyen. TRANSPORT SHIPS.—Sleipner, 110 tons, 87 knots; Midlegunden, Fremad, Kongedybet. 4 Icebreakers. 3 Cable Ships.

For Torpedo Boats and Submarines, see Flotilla Tables.

FRANCE.—Battleships.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power. Type of Machinery.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour.					Armament.		Speed.	Fuel.	Complement.					
											Belt.	Deck.	Side above Belt.	Bulkhead.	Gun Position.	Heavy Gun.	Second-ary.				Guns.	Torpedo Tubes.			
b.	Richelieu †	35,000	794 W.L.	0 108 6 26 7	155,000 (G.) I.	St. Nazaire	Brest	1939	1940	£	9-16	8	..	..	..	..	8 15-in., 15 6-in., 12 1-5-in. A.A., 2 catapults, 4 aircraft.	..	about 31	..	1500				
b.	Jean Bart						St. Nazaire	1939	1940	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
b.	Clemenceau †						Brest	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
b.c	Strasbourg	26,500	702	0 101 8 25 0	100,000 P.T. (G) I.	St. Nazaire	St. Nazaire	1936	1938	..	10-8	4-9	..	..	..	13-8	..	8 13-in., 16 5-1-in., 4 1-56-in., 8 1-46-in., 32 5 in., 1 catapult, 4 aircraft.	..	29½	..	1481			
b.c.	Dunkerque						Brest	1935	1937	5,200,000	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
b.	Bretagne * †	22,189	544	6 88 6 32 0 43,000 P.T. I.	43,000 P.T. I.	Brest	Brest	1913	1915	2,589,489	11-7	2½-1½	7	7	10½	7	10 13-4-in., 14 5-4-in., 8 3-in. A.A., 5 3-pr., 2 1-pr., 2 L., 4 seaplanes, 1 catapult.	4 (sub.) 18"	21-0	—	1190				
b.	Provence †						Lorient	1913	1916	2,589,000	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

† Reconstructed and modernised between 1923 and 1935.

* Probably a total loss.

† Reported to be extensively damaged.

FRANCE.—Battleships—continued.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost. £	Armour.					Armament.		Speed.	Fuel. Coal. Oil.	Complement.	
											Belt.	Deck.	Side above Belt.	Bulkhead.	Heavy Guns.	Gun Position. Second- ary.	Guns.				Torpedo Tubes.
b.	Courbet *†	22,189	551	0 92	6 32	0 28,000 Nic. P.T.	Brest	1911	1913	2,508,388	11-7 K.S.	24-1½	7 K.S.	7 K.S.	10½ K.S.	7 K.S.	12 12-in., 22 5-4-in., 7 3-in. A.A., 2 1-pr., 2 L.	4 (sub.) 18"	20-0	300 2700	1068
b.	Paris *†	22,189	551	0 92	6 32	6 28,000 Nic. P.T.	La Seyne	1912	1914	2,608,920	11-7 K.S.	24-1½	7 K.S.	7 K.S.	10½ K.S.	7 K.S.	8 13-4-in., 14 5-4-in., 8 3-9-in. A.A., 5 47mm. A.A., 2 1-pr., 2 L., 2 aircraft, 1 catapult	4 (sub.) 18"	21½	300 2600	1167
b.	Lorraine *	22,189	544	6 88	6 32	0 42,000 B. P.T.	St. Nazaire	1913	1916	2,642,439	11-7 K.S.	24-1½	7 K.S.	7 K.S.	10½ K.S.	7 K.S.					

* Reconstructed and modernised between 1923 and 1935.

† Operated by the Free French.

Aircraft Carriers.

Class.	NAME.	Standard Displacement.	Length. (Extreme).	Beam.	Draft.	Horse-power.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour.		Armament.	Speed.	Fuel.	Complement
											Belt. Deck.	Gun Position.				
A.C.	Bearn *	22,140	589	61 1/2	30 6	37,200 Tur. & R.	La Seyne	1920	1928	£ ..	in. 3 1/2 1-3	in. ..	8 6-1 1/2-in., 6 8-in. A.A., 8 1-pr. A.A., 12 M. A.A., 41 planes	4 21 1/2	— 2070	875
Aircraft Trans- port A.C.	Commandant Teste Joffre † Painlevé †	10,000	548	0 88	7 22	21,000 †	Bordeaux	1929	1932	..	2 1 1/2	..	12 3-9-in. A.A., 8 3-pr. A.A., 12 M., 19 planes, 4 catapults, 5 cranes.	—	oil	648
A.C.		18,000	775	0 112	0		St. Nazaire	Bldg.					5 1-in. guns, 40 planes.	32		

* Originally designed and laid down as a battleship; reconditioned 1935.

† Reported to be extensively damaged.

† Schneider-Zoelly turbines (G.). Yarrow-Loire S.T. boilers.

FRANCE.—Cruisers.

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Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draft.	Horse-Power.	Type of Machinery and Boilers.	Where Built.	Date of Launch.	Cost.	Armour.		Armament.		Speed.	Fuel.		Complement.
											Belt.	Gun Position.	Guns.	Torpedo Tubes.		Coal.	Oil.	
Training cruiser	Jeanne d'Arc	6496 tons.	557 ft. 9 in.	57 ft. 5 in.	18 ft. 8 in.	32,500		St. Nazaire	1930	£ ..	in. ..	in. ..	8 6.1-in., 4 3-in. A.A., 2 1.5-in., 2 M., 2 seaplanes, 2 catapults	2 21.7"	26 knots.	— tons.	— 1400	506
	De Grasse*	8000	..	..	..	..	..	Lorient	Bldg. ..	..	..	..	9 6-in., 6 3.9-in. A.A., 8 M. A.A., 2 aircraft	6 21"	..	..	..	..
Improved La Galissonnière	La Galissonnière							Brest	1933									
	Jean-de-Vienne							Lorient	1935									
	Marseillaise	7600	589	0 57	4 17	5	84,000 (G.)	St. Nazaire	1935	..	4 1/2	Deck 1 1/2	9 6-in., 8 3.5-in. A.A., 8 1.5-in. A.A., 4 seaplanes, 1 catapult	2 21.7"	31	— 1500		630
	Gloire							Bordeaux	1935									
	Montcalm							La Seyne	1935									
—	Georges Leygues							St. Nazaire	1935									
	Algérie	10,000	610	3 65	8 23	0	84,000 (G.) Pen.	Brest	1932	1,920,000	about 4	Deck 3	8 8-in., 12 3.9-in. A.A., 4 1.5-in., 16 M., 1 catapult, 2 seaplanes	2 21"	31	— 1900		746
	Dupleix								1930	1,570,000								
	Foch	10,000	636	6 63	6 24	0	90,000 Rat.(G.) G.	Brest	1929	1,450,000	..	..	8 8-in., 8 3.5-in. A.A., 6 1.46-in. A.A., 12 M., 3 seaplanes, 2 catapults	2 21"	32	— 1800		605
	Colbert								1928	1,270,000								
Suffren Class	Suffren	10,000	643	0 65	0 24	0	90,000 Rat.(G.) G.	Brest	1927	1,210,000	..	..	8 8-in., 8 3-in. A.A., 8 1.46-in. A.A., 12 M., 3 seaplanes, 2 catapults	2 21"	32	— 1800		605
	Tourville							(Lorient)	1926									
Duquesne Class	Duquesne	10,000	626	8 62	4 23	0	120,000 Rat.(G.) G.	Brest	1925	..	..	..	8 8-in., 8 3-in. A.A., 8 1.46-in., 2 seaplanes, 1 catapult	2 21"	33.5	— 2000		620

GERMANY.—Battleships.

Class.	NAME.	Normal Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Cost.	Armour.					Armament.		Speed.	Coal. Oil.	Complement.
										Belt.	Deck above Belt.	Side Bulkhead.	Heavy Guns.	Gun Position. Second. A.R.	Guns.	Torped. Tubes.			
b.	"H" and "I"	40,000	..	..	..	..	..	Bldg. ..	£ ..	in. ..	in. ..	in. ..	in. ..	in. ..	..	..	..	..	..
b.	Tirpitz	35,000	792	6118	026	0 (G.)	Wilhelms-haven	1939 1941	..	..	..	..	..	..	8 15-in., 12 5·9-in., 16 4·1-in., 4 seaplanes, 2 catapults	..	abt. 28	..	..
b.c.	Scharnhorst	26,000	741	698	624	8 (G.) & D.	Wilhelms-haven	1936 1939	..	13	6	..	..	..	{ 9 11-in., 12 5·9-in., 14 4·1-in. A.A., 16 1·5-in. A.A., 4 aircraft, 2 catapults	..	27	..	1461
b.c.	Gneisenau	26,000 (standard)	741	698	624	8 (G.) & D.	Kiel	1936 1938	..	..	..	..	..	..	{ 9 11-in., 12 5·9-in., 14 4·1-in. A.A., 16 1·5-in. A.A., 4 aircraft, 2 catapults	..	27	..	1461
b.*	Lutzow (ex-Deutschland)	10,000 (standard)	609	367	619	0-56,800 Diesel†	{ Deutsche Werke, Kiel Wilhelms-haven	1931 1933 3,750,000 estimated	about 4	14-3	..	..	about 7	—	6 11-in., 8 5·9-in., 6 4·1-in. A.A., 8 1·5-in. A.A., 10 M., 1 catapult, 2 aircraft (Q.)	8	26	—	965
b.*	Admiral Scheer	10,000 (standard)	609	367	619	0-56,800 Diesel†	{ Deutsche Werke, Kiel Wilhelms-haven	1933 1934 3,530,000 estimated	about 4	14-3	..	..	about 7	—	6 11-in., 8 5·9-in., 6 4·1-in. A.A., 8 1·5-in. A.A., 10 M., 1 catapult, 2 aircraft (Q.)	8	26	1200	965
b.	Schlesien †	12,300	419	072	1025	3	{ Schichau Germania	1906 1908 1,214,000	9½-4	3	8	6	11-6	6½	4 11-in., 10 5·9-in., 4 3·5-in. in. A.A., 23 M.	..	18	1771	727
b.	Schleswig-Holstein †	12,300	419	072	1025	3	{ Schichau Germania	1906 1908 1,214,000	9½-4	3	8	6	11-6	6½	4 11-in., 10 5·9-in., 4 3·5-in. in. A.A., 23 M.	..	18	1771	727
A. C.	Graf Zeppelin	19,250	820	388	618	4 (G.)	{ Deutsche Werke Germania	1938	..	..	..	..	..	..	16 5·9-in., 10 4·1-in., H.A. 22 smaller, 40 aircraft	..	about 32	..	..
A. C.	"B"	..	..	..	..	..	Werft Bldg.	..	..	..	..	..	..	..	..	..	..	..	..

AIRCRAFT CARRIERS.

* Officially rated as "Armoured Ships." † Reconstructed 1925-30. Classified as schoolships. ‡ Consists of eight double acting two-stroke M.A.N. Diesels. § Reported to be extensively damaged.

GERMANY.—Cruisers.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam. (Extreme.)	Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Maker of Engines.	Date of Launch.	Date of Completion.	Cost.	Armour.		Armament.		Speed.	Fuel.		Complement.
												Belt.	Gun Position.	Guns.	Torpedo Tubes.		Coal.	Oil.	
cr.	Admiral Hipper.	10,000 tons.	639 9 W. L.	69 11	15 5	(G.)	Blohm and Voos	..	1937	1939	..	in.	..	8 8-in., 12 4.1-in. A.A., 12 1.45-in. A.A.; 3 aircraft, 1 catapult	4 21-in. (T.)	32	..	1000	
cr.	Prinz Eugen	10,000 tons.	654 6 W. L.	71 3	15 1	(G.)	Germania Werft Deschimag Deschimag	..	1938	1940	..	..	..	8 8-in., 12 4.1-in. A.A., 12 1.45-in. A.A.; 3 aircraft, 1 catapult	4 21-in. (T.)	32	..	1000
cr.	Seydlitz ex-Lutzow								1938	1940	..	..	8 8-in., 12 4.1-in. A.A., 12 1.45-in. A.A.; 3 aircraft, 1 catapult	4 21-in. (T.)	32	..	1000	
cr.	M, N, O and P	7300 tons.	584 0	55 6	15 9	80,000 (G.) & D.	Deutsche Werft, Kiel	..	Bldg.	..	..	..	..	8 5.9-in., 4 4-in., 1 aircraft	8 21-in.	32	..	..
l.c.	Leipzig	..	581 0	..	..	72,000† (geared turbines 60,000, Diesels 12,000)	Wilhelmshaven	Kiel	1929	1931	2,050,000	3-4	..	9 5.9-in., 8 8.5-in. A.A., 8 1.5-in. A.A.; 1 catapult, 2 aircraft	4 triple 21-in. s.w.	32	1500 (including Diesel oil)	656
l.c.	Nürnberg.	6000 tons.	557 9 W. L.	53 5	15 7	..	Kiel	Kiel	1934	1935	..	..	..	..	..	..	..	..
l.c.	Köln.	6000 tons.	570 10	49 10	17 8	65,000†	Wilhelmshaven	Kiel	1928	1930	1,785,000	3	..	9 5.9-in., 8 8.5-in. A.A., 1 catapult, 2 aircraft	4 triple 21-in. s.w.	32	1200	592	
l.c.	Emden *	5400 tons.	510 2	46 11	17 4	46,500 (G.)	Wilhelmshaven	Wilhelmshaven	1925	1925	..	4	..	8 5.9-in., 3 8.5-in. A.A., 4 M.	2 twin 19.7-in. s.w.	29	1260	630	

* Training Ship.

† Three propeller shafts, of which the centre shaft is Diesel-driven and the others turbine-driven. Diesels used for cruising or combined with the turbines to give full speed.

‡ Reported to be extensively damaged.

§ Parsons geared turbines with Diesels for cruising.

GERMANY.—Miscellaneous Craft.

- ESCORT VESSELS.—F 1, 2, 4, 5, 7, 8, 9, 10 (1936), 600 tons, 240 feet, 28 knots, 2 4-1-in. 4 1-46-in., complement 103.
- GUNNERY TRAINING SHIPS.—*Drache* (1908), 790 tons, 15 knots, 4 4-1-in.; *Fuchs* (1919), 525 tons, 16 knots, 2 3-4-in.; *Brummer* (1936), 2,410 tons, 20 knots 4 4-in. guns; *Delphin*; *Mars*; *Eduard Jungman*. Carl Zeiss.
- FISHERY PROTECTION VESSELS.—*Weeser* and *Elbe* (Wilhelmshaven, 1931), 590 tons, 1600 H.P. (Diesel), 15 knots, 1 3-5-in. gun.
- EXPERIMENTAL VESSELS.—*Pelican* and *Nautilus* (600 tons, 17 knots); *Strahl*, 1,643 tons, 10 knots; *Stortebeker* and *Arkona*, 525 tons, 16 knots, 1 4-1-in. gun. Klaus von Bevern (1911), 800 tons, 25 knots, 2 4-1-in.
- MOTOR TORPEDO BOATS ("E" BOATS).—S 6 (1932), 46 tons, 2,400 B.H.P., 31-32 knots, 1 m.g. A.A., 2 19-7-in. T.T.; S 7-17 (1934-38), and S 18-25 (1939), 70 tons, 1 m.g. A.A., 2 19-7-in. T.T.; S 26-50 (1939), 86 tons, 105-ft., 36 knots, 2 1-46-in. A.A.
- PATROL VESSELS.—UZ (S) 18, UZ 32, 33, 60 tons, 14 knots.
- TENDERS.—*Hecht*, *Gazelle*, *Frauenlob*, 525 tons, 16 knots. *Nordsee*, 830 tons, 12 knots; *Taucher*, 202 tons, 6-6 knots; *Hai*, *Konigen Luise*, 600 tons, 28 knots, 2 4-1-in.; *Paul Beneke*, 460 tons, 13 knots; *Taku* (1919), 450 tons, 16 knots, 1 4-1-in.
- SAILING TRAINING SHIPS.—*Gorch Fock* (Hamburg, 1933); *Three-masted barque*, 239 feet in length, 1,500 tons, 500 H.P. auxiliary motor giving 8 knots; *Horst Weessel* (1936) and *Leo Schlageter* (1938), 1,634 tons, 295 ft. 3 in. in length, 35 ft. 4 in. beam, 15 ft. 9 in. draught, 750 H.P., auxiliary motor giving 10 knots, complement 78, accommodation for 200 cadets. *Training Vessels*.—*Nordsee* (1914), 830 tons, 12 knots; *Paul Beneke* (1936), 460 tons, 13 knots; *Dahme*, *Spree*, *Beowulf*, *Freyt*, *Frühlof*, *Wotan*, *Sigfrid Hagen*, *Hugin*, *Hildebrand*, *Odin*, *Volker*, and *Münin*.
- MOTOR MINESWEEPERS.—R 1-16 (1933-4), 85 ft., 44 tons, 700 H.P., 17½ knots, 1 1-pr. gun; R 17-34 (1935-1938), R 34-40 (1939), 90 tons. *Mining and Barrage vessels* MT 1 and 2, 550 tons, 10 knots; 8 small craft (1906-15), 70 tons, 9 knots; I-IV (1936), 120 tons.
- TARGET SHIPS.—*Zähringen* (ex-battleship), 11,800 tons, 13 knots; *Hessen*, 13,000 tons. *Wireless controlled*.
- TARGET TUGS AND CONTROL SHIPS.—*Komet* and *Blitz*, 650 tons, 30 knots ex T.B.'s. *Blitz* is control ship for *Zähringen*.
- DEPORT SHIPS.—*Taigtau* (1934), 1,970 tons, 17½ knots, 2 3-5-in., 4 m.g.; *Saar* (1934), 2,710 tons, 16 knots, 3 4-1-in., 4 m.g.; *Weichsel* (1923), 3,950 tons, 10½ knots. *Donau*, 10 knots; *Karl Peters* (1940), 3,500 tons; *Tanga* (1939); *Waldemar Kophamel* and *Wilhelm Bauer* (1940); *Erwin Wassner* (1938), 6,000 tons; *Brommy* (1916), 380 tons, 16 knots, 1 4-1-in.; *Kaula* (ex-Wacht), 1919; *Von der Groeben* (1919).
- TORPEDO RECOVERY VESSEL.—*Orkan* (1916), 470 tons, 10 knots; ex-Torpedo Boats 123, 139, 155, 156, 157, 158, 196, 650 tons, 22 knots, 1 or 2 m.
- SURVEYING VESSELS.—*Meteor* (1924), 1,160 tons, 14 knots, one 3-4-in.; *Hodge*, *Norderoog*, *Suderoog* (1912), 90 tons.
- MINESWEEPERS.—17 in number (1917-1919), 475-525 tons, 1,800 H.P., 16 knots, 1 4-1-in. gun; M 1-40 600 tons, 17 knots, 2 4-1-in. guns, 1 1-46-in. OILERS.—*Samland*, 10,111 tons; *Franken*, *Ditmarschen*, *Ermeland*, *Westerwald*.
- U-BOAT TENDERS.—*Memel*, 998 tons, 13 knots; *Mosel*, 796 tons, 9 knots; *Acheron*, *Jagd*, 525 tons, 16 knots; *Warnow*, 728 tons gross, 13 knots; *Lech*, 3,850 tons, 13 knots.
- SLOOPS.—*Hela* (1940), *Grille* (1935), 2,560 tons, 20 knots, 3 4-1-in., 2 1-46-in. A.A., 4 m.
- MINELAYERS.—A, B, C, and D (1940); M.T.1., M.T.2 (1917), 550 tons, 10 knots, 1 m.; C 1, 3, 5, 9, 10, 14, 16, 21-30, 80 tons, 9 knots.
- HOSPITAL SHIPS.—8 in Number.
- RIVER PATROL VESSELS.—*Birago* (1916), 60 tons, 11 knots; *Bechelaren* (1932), 185 tons, 16-8 knots, 4 2-6-in. 4 m.
- RIVER MINESWEEPERS.—FHR 1-12.

For Destroyers, Torpedo Boats and Submarines, see *Flotilla Tables*.

GREECE.†

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draft.	Horse-Power. Type of Machinery.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour.						Armament.		Speed.	Coal. Oil.	Complement
											Belt.	Deck.	Side above Belt.	Bulkhead.	Heavy Guns.	Gun Position.					
cr.	Giorgios Averoff *	tons. 9801	ft. 462	ft. 69	ft. 24½	19,000 (21,500 <i>h</i>) B.	Leghorna (Orlando)	1910	1911	£ 1,100,000	in. 8-3½	in. 1½	in. 7	in. 7	in. 8-6½	in. 7	4 9·2-in., 87·5-in., 16 8-in., 4 3-pr., 2 3-in. A.A., 2 M. 18-in.	3 (sub.) 22½ (24 <i>i</i>). 18-in. †	knots. 22½ (24 <i>i</i>). †	tons. 1500	620

* Retubed and refitted 1932.

† Probable speed 15 knots.

TRAINING SHIP.—Ares (1929), 1,870 tons, 11 knots, four 3-in. guns.

REPAIR SHIP.—Hephestos (1920), 4,519 tons gross, 11½ knots, four 4-in. A.A.

M.T.B.'s, T1 and T2, Thornycroft type, 55 ft., 37 knots, two Lewis guns 2 r.r., 4 built at Venice, for Customs Service T3 and T4, 66 ft., 43 knots, 82 tons, 2 r.r., building.

DESPATCH VESSELS AND MINELAYERS.—Korgialenios, 380 tons, 13 knots, 50 mines; Tonados, 450 tons, 13 knots, 40 mines.

MINESWEEPERS.—Nestos, Aliakmon, Axios, Strymon.

COAST DEFENCE VESSELS.—Lemnos (ex-U.S.N. Idaho) and Kilikis (ex-U.S.N. Mississippi) (1908).

‡ Under the control of Germany. Part of the Greek Fleet is in British Hands.

For Destroyers, Torpedo Boats and Submarines, see Flotilla Tables.

ITALY.—Battlehips.

Class.	NAME.	Standard Displacement.	Length. (Extreme).	Beam.	Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour.						Armament.		Speed.	Fuel. Coal. Oil.	Complement.		
											Belt.	Deck.	Side above Belt.	Bulkhead.	Heavy Guns.	Second. Art.	Guns.	Torpedo Tubes.					
b.	Roma *	35,000	774 0	106 6	28	180,000	Trieste	1940	..	4	in.	10	..	..	in.	in.	9 15-in., 12 6-in., 12 3-5-in., 40 A.A. M.G., 2 catapults, 3 aircraft	..	30	1600		
b.	Impero *						Genoa (Ansaldo)	1939
b.	Littorio *	35,000	774 0	106 6	28	130,000 P.T. (G.)	Genoa (Ansaldo)	1937	1940	..	10	..	..	..	..	..	9 15-in., 12 6-in., 12 3-5-in. A.A., 40 A.A. M.G., 2 catapults, 3 aircraft	..	30	..	1600	
b.	Vittorio Veneto						Trieste
b.	Andrea Doria†	..	..	..	..	..	Spezia	1913	1916	..	10-4	1½	6	..	9½	6	10 12-5-in., 12 5-3-in., 10 3-5-in., 39 A.A. M.G., 1 catapult, 1 aircraft	..	27	1200	1074	
b.	Caio Duilio†						Castellamare	1913	1915	..	10-4	1½	6	..	9½	6
b.	Conte di Cavour†	23,622	611 6	92 0	30	75,000 (G.)	Spezia	1911	1915	..	10-4½	1½	6	..	9½	5	10 12-6-in., 12 4-7-4-in., 8 3-9-in. A.A., 36 A.A. M.G., 2 catapults, 4 aircraft	..	27	2000	1200		
b.	Giulio Cesare†	Genoa (Ansaldo)	1911	1914	..	10-4½	1½	6	..	9½	5	1200	

* Building ceased through lack of materials.

† Reconstructed 1940.

‡ Reconstructed 1937.

ITALY.—Cruisers, &c.

Class.	NAME.	Displacement. Standard.	Length. (Extreme).	Beam.	Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour.		Armament.		Speed.	Fuel. Oil.	Complement.
											Side. Deck.	Gun Position.	Guns.	Torpedo Tubes.			
		tons.	ft. ins.	ft. ins.	ft.					£	in.	in.			knots.	tons.	
Improved Condottieri Class	{ Luigi di Savoia Duca degli Abruzzi Giuseppe Garibaldi }	7874	613 9	61 0	17	100,000 P.F. (G.)	{ Odero-Terni, Or- lando Spezia Cantieri Riuniti dell' Adriatico, Trieste }	1935	1936	..	Aht. 6	..	10 6-in., 8 3-9-in. A.A., 8 1-5-in. A.A., 8 M., 4 air- craft, 2 catapults. Fitted for minelaying	2 21"	35	1200	600
Attendolo Class	{ Eugenio di Savoia Emanuele Filii- berto, Duca d'Aosta }	7283	610 3	57 4	16 4	110,000 (G.)	{ Ansaldo, Genoa Orlando, Leghorn }	1935	1936	..	About 4½	..	8 6-in., 6 3-9 in., 8 1-5-in. A.A., 8-5-in. M., 1 catapult, 3 aircraft.	6 21"	36½	1200½	550
Condottieri Class	{ Raimondo Montecuccoli Muzio Attendolo }	6941	597 9	54 6	14-2	108,000 P.F. (G.)	{ Ansaldo, Genoa Trieste }	1934	1935	..	..	..	8 6-in., 6 3-9-in. A.A., 8 1-5-in. A.A., 8-5-in. M., 2 aircraft, 1 catapult. Fitted for minelaying	2 21"	37	oil	520
Modified Trento Class	{ Bolzano. }	10,000	646 3	67 8	18 0	150,000 (G.) A.	Ansaldo, Genoa	1932	1933	..	Aht. 3	..	8 8-in., 12 3-9-in. A.A., 8 1-5-in. A.A., 8-5-in. M. A.A., 1 catapult, 2 seaplanes	8 21"	36	3000	800
Condottieri Class	{ Luigi Cadorna }	5008	554 6	50 10	14	95,000 (G.)	Stabilimento Tec- nico Triestino, Trieste	1931	1933	..	2 2	..	8 6-in., 6 3-9-in. A.A., 8 1-5-in. A.A., 8-5 M., 1 catapult, 2 seaplanes	4 21"	37 (39½ L.)	1000	530
Zara Class	{ Gorizia. }	10,000	599 9	67 7	19 6	95,000 (G.)	Odero-Terni, Or- lando	1930	1931	..	About 6 2	..	8 8-in., 12 3-9-in. A.A., 8 1-5-in. A.A., 8-5-in. M. A.A., 1 cata- pult, 2 seaplanes	—	32	2200	800
Condottieri Class	{ Giov. delle Bande Nere. }	5069	555 5	50 10	14-2	95,000 (G.)	Castellamare	1929	1931	..	1½ 1	..	8 6-in., 6 3-9-in. A.A., 8 1-5-in. A.A., 8-5 M., 1 catapult, 2 seaplanes. Fitted for mine- laying	4 21"	37	1200	500

ITALY.—Cruisers, &c.—continued.

Class.	NAME.	Standard Displacement.	Length. (Extreme).	Beam.	Draught.	Horse-Power. Type of Machinery.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour.	Armament.	Speed.	Fuel. Coal. Oil.	Complement.
Trento Class	Trento . . .	10,000	645 0	67 9	18	150,000 (G.)	Orlando, Leghorn	1926	1929	£ . .	in. 2½ Side Deck. 2	Guns. { 8 8-in., 12 8-9-in. A.A., 4 1-57-in., 8 5-in. A.A. M., 1 catapult, 2 seaplanes	Torpedo Tubes. { 8 a.w. (D.) 21"	tons. — 3000 800	1000
	Trieste † . .							1927							
I. o.	Bari (ex-German Pillau)	3248	443 11	44 7	13½	28,000 tur.	Danwig (Schichau).	1914	1915	..	3 1½-4	8 5-9-in., 3 3-in. A.A., 3 M., 120 mines	—	984 250	872
I. cr.	Taranto (ex-German Strassburg)	3184	455 0	42 2	12½	27,000 P.T.	Wilhelmshaven	1911	1914	416,840	4-2½ 2	7 5-9-in., 2 3-in. A.A., 3 M., 120 mines, 1 aircraft	—	1200 130	373
s.o.	Miraglia* . .	4882	397 0	49 8	17	12,000 P.T.	Spezia . .	1923	1927	..	..	4 4-in. A.A., 4 M., 2 catapults, 16 planes	—	— 440	300
cr..	Ammiraglio Constante Ciano	8000	..	..	..	..	..	Bldg.	..	..	..	— 6-in. guns	..	..	..
I. cr.	Cornelio Silla Paolo Emilio Attilio Regolo Scipione Africano Cato Mario Claudio Tiberio Pompeo Magno Ottaviano Augusto Ulpio Traiano Claudio Druso Vipsanio Agrippa Gaius Germanicus	3360	444 3	44 9	13	120,000	Genoa Leghorn Spezia . . Ancona Palermo Trigoso Naples . .	Bldg. .. Bldg. .. .. .. ..	..	..	..	8 5-3-in., 6 2-5-in., 14 M. A.A., carries mines	41	..	..

* Ex-merchant ship, taken over on the stocks. Aircraft transport.

† Fleet Flagship.

- COMBINED MINELAYERS AND MINESWEEPERS.**—Fasana, Buccari, Durazzo, and Pelagosa, completed 1926, 531 tons, 10 knots (I.C. machinery), 1 3-in. gun, 100 mines; Azio, Legnano, Lepanto, completed 1926-7, 615 tons, 15 knots (recip.), 2 4-in., 1 3-in., 80 mines; Crotone, Viesti, 359 tons, 195 ft., 1,600 H.P., 14 knots, 2 4-in. guns, 70 mines.
- MINELAYERS.**—Laura, Rovigno, and Albona (ex-Austrian), 112 tons, 11 knots, 1 3-in.; fourteen converted merchant vessels, 12-15 knots.
- MINESWEEPERS.**—39 in number, 150 tons, 14 knots, 1 3-in. gun; P. Matteucci, M. Sonzini (1924), 188 ft., 620 tons, 9 knots, 2 3-in.; R.D.I. (1938), 188 tons, 10 knots, 1 3-in.
- OIL TANKERS.**—Tavrisio, 10,910 tons, 11 knots, 4 4-7-in., 2 3-in.; Stige, 1,342 tons, 8 knots, 1 4-7-in., 1 3-in.; Urano, 10,550 tons, 11 knots, 2 4-7-in., 2 3-in.; Brennero, 9,800 tons, 11 knots, 4 4-7-in., 2 3-in. (fitted with water protection); Prometeo, 1,080 tons, 11 knots, 2 3-in.; Nettuno, 9,555 tons, 14 knots, 3 4-7-in., 2 3-in.; Cocito, Lete, 1,162 tons, 10 knots, 3 3-in., Cerere, 2,530 tons, 10 knots, 1 4-7-in., 2 3-in.; Bronte, 8,240 tons, 14 knots, 2 3-in.; Marte, 10 knots, 2 3-in.
- RIVER GUNBOATS.**—E. Carlotto (1918), 180 tons, 14 knots, 2 3-in. A.A. guns.
- ESCOPT GUNBOATS.**—A. Badile, E. Giovannini (1922), 182 tons, 23 knots, 2 4-in. guns, 2 T.T.; Orsa, Orione, Procione, Pegaseo (1918), 293 ft., 855 tons, 28 knots, 2 8-9-in., 8 m.g.
- SURVEYING VESSELS.**—Ammiraglio Magnaghi (1914), 1506 tons, 14 knots, 4 3-in.; Cariddi (1916), 380 tons, 10 knots, 1 3-in. gun; Chemo, 3,988 tons, 10 knots, 4 4-7-in. guns.
- PATROL VESSELS.**—Cirene (1912), 384 tons, 10 knots, 2 3-in.; Rimini (1912), 319 tons, 9 knots, 1 3-in. gun; Gallipoli (1911), 310 tons, 10 knots, 2 3-in. guns; Otranto (1911), 290 tons, 10 knots, 2 3-in.; Alula (1912), 308 tons, 13 knots, 1 3-in. gun; Palmatola (1902), 472 tons, 8 knots, 1 3-in.; Aurora, 935 tons, 14 knots, 2 2-4-in.; Illiria (1918), 654 tons, 11 knots.
- TRAINING SHIPS.**—Cristoforo Colombo (Castellamare, 1928), 2,787 tons, 10 knots (Diesel-electric) 4 8-in. guns, 2 A.A. m.g.; Amerigo Vespucci (Castellamare, 1931), 3,543 tons, 1,800 H.P. (Diesel-electric), 11 knots, 4 3-in. A.A., 2 A.A. m.g.
- SUBMARINE DEPOT SHIPS (Sloops).**—Volta and Pacinotti (1924), 2,730 tons, 19 knots, 4 3-in. A.A.; Sebastiano Cabota (1912), 778 tons, 13 knots, 6 3-in., 4 m.
- CABLE SHIPS.**—Citta di Milano (5,300 tons), 10 knots; Gisone, 1192 tons, 250 ft., 15 knots.
- TUGS.**—87 in number, 100-300 tons, 8-13 knots, some fitted with 1 3-in. gun.
- WATER CARRIERS.**—Dalmazia, Istria, 2,900 tons, 10 knots, 1 4-7-in., 1 3-in.; Flegelonte, 1,162 tons, 9 knots, 3 3-in. A.A.; Verde, Pagano, 1,432 tons, 9 knots, 1 4-7-in., 1 3-in. A.A.; Ticino, 2,588 tons, 9 knots, 2 3-in.; Isonzo, Po, Volturno, 11 knots, 2 4-in., 4 m.g.; Scivivia, Tirso, 9 knots, 4 m.g.; Minicio, Bormida, 645 tons, 9 knots; Sesia, Garigliano, 1,050 tons, 9 knots, 4 m.g.; Adige (1928), 780 tons, 8 knots; Arno and Brenta (1929), 630 tons, 9 knots; Garda, Verbano, Sebeto, Metauro, Sile (1934), 592 tons, 9 knots.
- MOTOR TORPEDO BOATS.**—M.A.S. 423-437, 15 tons, 45 knots, 2 18-in. T.T., 5 depth charges; M.A.S. 438-441, 35 tons; M.A.S. 501-516, 47 knots, 2 18-in. T.T., 6 depth charges; M.A.S. 517-551, 20 tons, 47 knots, 1 m.g., 2 18-in. T.T.; General Stefano Turr (1939), 34 knots, 2 m., 4 18-in. T.T.
- TRANSPORT SHIPS.**—Lussini, 3,988 tons, 10 knots, 4 4-7-in., 2 3-in.; Tripoli, 2,460 tons, 8 knots; Panigaglia, Vallerunga, Buffoluto (Ammunition transport ships), 916 tons, 11 knots, 2 3-9-in.; Enrichetta, 8,860 tons, 9 knots.
- LIGHTHOUSE TENDERS.**—Lante, 295 tons, 12 knots, 2 3-in.; Bianco, 258 tons, 11 knots, 2 3-in.; Lutti, 268 tons, 12 knots, 1 3-in.; Levanzo, 296 tons, 11 knots, 2 3-in.; Solla, 350 tons, 9 knots, 1 3-in.; Lido, 226 tons, 12 knots, 1 3-in.
- MONITORS.**—Faa di Bruno (1917), 2,796 tons, 33 knots, 2 15-in., 6 3-in.; Monte Grappa, Montello (1919), 605 tons, 7 knots, 1 12-in., 2 3-in.; Monte Cengio, Monte Noveano (1919), 502 tons, 7 knots, 1 12-in., 4 3-in.
- TARGET SHIP.**—San Marco, Old Cruiser (wireless controlled).
- ESCOPT VESSEL.**—Eritrea, 2,172 tons, 20 knots, 4 4-7-in. guns, fitted for minelaying.
- REPAIR SHIP.**—Quarnaro (1927), 7,185 tons, 11 knots, 3 4-in.
- MOTOR VEDETTES.**—Vigilante, Vedetta (1938), 85 ft., 70 tons, 400 H.P. (D.) 12-3 knots, 1 3-in.
- HOSPITAL SHIP.**—8 in number.
- SALVAGE SHIPS.**—Ciclope (1903), 1,050 tons, 13-5 knots, 1 3-in.; Tesco (1915), 1,250 tons, 16 knots, 2 3-in.; Anteo (1912), 1,250 tons, 8 knots. Titano (1913), 828 tons, 14 knots, 1 3 in.

For Destroyers, Torpedo Boats and Submarines, see Flotilla Tables.

JAPAN.—Battleships.

Type.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Cost.	Armour.				Armament.		Speed.	Fuel. Oil.	Complement.		
		tons.	ft. ins.	ft. ins.	ft. ins.					Belt.	Deck.	Side above Belt.	Bulkhead.	Heavy Guns.	Gun Position. Second-ary.	Guns.	Torpedo Tubes.	knots.	tons.	
	Nissin . Takamuta I. . . . II. . . . III. . . .	45,000	..	..	..	..	Kure . Yokosuka . Nagasaki . Kobe . Kure .	1939 1941 .. Bldg. Bldg. ..	..	..	..	..	..	..	..	9 16-in.	..	..	30	..
Fuso Class	(Fuso § . Yamashiro §	20,830 673	0 94	0 28	6	40,000 B.C.T. K.	Kure . Yokosuka .	1914 1915 .. 1915 1917	..	12 8 K.S. K.S.	8 8 K.S. K.S.	..	..	12 12 K.S. K.S.	6 6 K.S. K.S.	12 14-in., 16 6-in., 8 5-in. A.A., 4 M., 4 L., 3 sea-planes, 1 catapult	..	22.5	4500	1300
Ise Class	(Hyuga * . Ise * . . .	29,990 683	0 94	0 28	8	45,000 P.T. 45,000 B.C.T. K.	Nagasaki . (Mitsubishi) Kobe . (Kawasaki)	1917 1918 .. 1916 1917	..	12 12 K.S. K.S.	8 8 K.S. K.S.	..	..	12 12 K.S. K.S.	6 6 K.S. K.S.	12 14-in., 18 5.5-in., 8 5-in. A.A., 8 M. H.A., 3 sea-planes, 1 catapult	..	23	4500	1360
Kongo Class	(Kirishima * Kongo † Hiei † .	29,830 704	0 95	0 27	6	64,000 P.T. K.	Nagasaki . (Mitsubishi) Barrow .	1913 1915 .. 1912 1913 2,500,000	..	8-3 K.S.	2 3 K.S.	6	..	10 10 K.S. K.S.	6 6 K.S. K.S.	8 14-in., 16 6-in., 8 5-in. A.A., 4 M., 4 L., 3 sea-planes, 1 catapult	4 (sub.) 27-in.	26	4500	1250
Nagato Class	(Mutsu * Nagato *	32,720 700	0 95	0 30	0	80,000 (G.) K.	Yokosuka . Kure .	1920 1921 .. 1919 1920	..	12-9 K.S.	3 3 K.S.	..	..	14 14	..	8 16-in., 20 5.5-in., 8 5-in. A.A., 8 A.A. M.G., 3 sea-planes, 1 catapult	..	24	3400	1804 1867 (as fleet flag-ship)

ARMoured CRUISERS now rated as COAST-DEFENSE SHIPS (1st class), completed 1899-1904: Kasuga, 7080 tons, 20 knots, 1 10-in., 2 8-in., 14 6-in.; Yakumo, 9010 tons, 16 knots, 4 8-in., 12 6-in., 5 3-in.; Adzuma, 8640 tons, 16 knots, 4 8-in., 12 6-in., 5 3-in.; Idzumo and Iwate, 9180 tons, 20 knots, 16 knots, 4 8-in., 14 6-in., 5 3-in.; Asama, 9240 tons, 21 knots, 4 8-in., 12 6-in., 5 3-in., used as a training ship.

* Reconstructed 1936.
† Modernised 1934.

‡ Reconstructed 1939.
§ Modernised 1934.
† Modernised 1934.
‡ Reconstructed 1939.
§ Modernised 1934.
† Modernised 1934.
‡ Reconstructed 1939.
§ Modernised 1934.

JAPAN.—Aircraft Carriers.

Class.	NAME.	Displacement.	Length. (Extreme.)	Beam.	Draught.	Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour.		Armament.		Speed.	Fuel. Oil.	Complement.
		tons.	ft. b.p.	ft. ft.	ft. in.					£	Side Deck.	Gun Position.	Gen.	Torpedo Tubes.	knots.	tons.	
A.O.	Akagi*	26,900	763 b.p.	92	21 2	131,200 B.C.T. K.	Kure	1925	1927	..	..	..	10 8-in., 12 4-7-in. A.A., capacity for 50 aircraft. Carries about 30 aircraft.	—	28.5	3900	1500
A.O.	Hosho (Hosyo)†	7470	510 b.p.	48 62	15 0	30,000 (G.) K.	Tsurumi. (Asano)	1921	1922	..	..	..	4 5-6-in., 2 3-4-in. A.A., 20 aircraft	—	25	2700	550
S.O.	Kamoi‡	17,000	495	67	28 0	8,000 G.C.T. Co.	New York S.B. Co.	1922	1922 (con- verted 1933)	..	..	..	2 5-5-in., 2 3-in. A.A., 15 seaplanes	—	15	4000	..
A.O.	Kaga†	26,900	715 b.p.	102½	22 1	91,000 B.C.T. K. drive electric and	Kobe (Kawa- saki)	1921	1928	..	..	..	10 8-in., 16 4-7-in. A.A., 20 A.A. M.G., capacity for 60 aircraft. Carries about 30 aircraft	—	23	5300	..
S.O.	Notoro‡	14,050	455 b.p.	58	26 6	5,850 recip.	Kobe (Kawa- saki)	1920	1920	..	..	..	2 4-7-in., 2 3-in. A.A., 16 seaplanes	—	12	1000	..
A.O.	Eyujo†	7100	548	60' 8"	15 0	40,000 (G.)	Yokohama	1931	1933	..	..	..	12 5-in., A.A., 30 aircraft	—	25	oil	600
A.O.	Soryu†	10,050	698	68' 4"	16 6	60,000 (G.) K. Yokosuka	Kure Yokosuka	1935	1937	..	..	..	12 5-in., A.A., 40 aircraft	—	30	..	..
A.O.	Hiryu†							1937	1938								
A.O.	Koryu†							1938	1939								
S.O.	Chitose (Titose)	9,000	577½	61' 8"	19 0	15,000 tur.&t.b. Kure	Kure	1936	1938	..	..	..	6 5-in. A.A., 12 A.A. M.G.	—	{ 20 20 17	..	..
S.O.	Chiyoda (Hiyoda)							1937	1938								
S.O.	Misao (Miduho)							1938	1939								
A.O.	Kamikawa	..	..	..	..	9,000 Kobe	Kobe	..	1937	..	..	..	2 3-in., 10 seaplanes	—	16	..	..
A.O.	Shokaku	..	..	..	..	(G.) Yokosuka	Yokosuka	1939	1941	..	..	..	—	—	..	..	..
A.O.	Zuikaku	..	..	..	..	(G.) Yokosuka	Yokosuka	1939	1941	..	..	..	—	—	..	..	..

* Designed as a battle cruiser.

† Fitted with gyro-stabiliser.

‡ Designed as a battleship.

§ Converted from oilers.

JAPAN.—Cruisers.

Class.	NAME.	Standard Displacement.	Length. (Extreme)	Beam.	Draft.	Horse-Power. Type of Machinery.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour.		Armament.	Speed.	Fuel.	Complemt.
											Side Deck.	Gun Position.				
	I.						Mitsubishi	1940		£	in.	in.			tons.	
	II.						Maizuru	Bldg.	..	..	6	..	6 12-in.	..	..	..
	III.	15,000	..	..	..	..	Yokosuka	Bldg.	..	..	..	..	12 6 1-in., 8 5-in. A.A., 4 3-in. 6 M.G., 4 aircraft, 2 catapults	4 21-in. a.w. (T.)	..	..
	IV.						Yokosuka	Bldg.	1937	..	2	..	15 6 1-in., 8 5-in. A.A., 4 3-in. 12 M.G., 2 catapults, 4 aircraft	4 21-in. a.w. (T.)	..	..
	V.						Kure	Bldg.	1938	..	2	..	10 8-in., 4 4 7-in. A.A., 8 A.A. M.G., 2 catapults, 4 sea-planes	8 21-in. a.w.	2000	692
Mogami Class	Tone	8500	614 3	63	14' 7"	90,000 (G.)	Nagasaki.	1937	1938	..	3-4	..	10 8-in., 8 4 7-in. A.A., 2 M., 2 catapults, 4 sea-planes	12 21-in. a.w.	—	750
	Tikuma	8450	w.l.			K.		1938	1939	2,500,000 estimated	3-5	..	7 5 5-in., 2 3-in. A.A., 2 M., 1 sea-plane, 1 catapult, 80 mines	4 21-in. a.w. (D.)	400	604
	Mogami						Kure	1934	1935		3-4	..				
	Mikuma						Nagasaki	1934	1935		3-5	..				
Takao Class	Suzuya	8500	640	59½	14' 9"	90,000 (G.)	Yokosuka	1934	1936	..	3-4	..	10 8-in., 8 4 7-in. A.A., 2 M., 2 catapults, 4 sea-planes	12 21-in. a.w.	2000	692
	Kumano					K.	Kawasaki	1936	1937	..	3-4	..				
	Chokai.						Nagasaki	1931	1932	..	3-4	..				
	Maya	9850	650	62½	16½	100,000 (G.)	Kobe	1930	1932	..	3-5	..				
Nachi Class	Atago						Kure	1930	1932	..	3-4	..				
	Takao					K.	Yokosuka	1930	1932	..	3-5	..				
	Ashigara						Kobe	1928	1929	..	3-4	..				
	Higuro	10,000	640	62½	16½	100,000 (G.)	Nagasaki	1928	1929	..	3-5	..				
Furutaka Class	Myoko						Yokosuka	1927	1928	..	3-4	..				
	Nachi						Kure	1926	1927	..	3-4	..				
	Kinugasa						Kawasaki, Kobe	1926	1927	..	3-4	..				
	Aoba	7100	595	50½	14½	95,000 (G.)	Nagasaki	1926	1927	..	3-4	..				
Natori Class	Furutaka						"	1925	1926	..	3-4	..				
	Kako						Kawasaki, Kobe	1925	1926	..	3-4	..				
	Abukuma						Uraga	1923	1925	..	3-4	..				
	Isuzu						Uraga	1921	1923	..	3-4	..				
Natori Class	Nagara						Sasebo	1922	1922	..	3-4	..				
	Natori	5170	535	47½	15½	70,000 (G.)	Nagasaki	1922	1922	..	3-4	..				
	Yura						(Mitsubishi)	1922	1922	..	3-4	..				
	Kinu						Sasebo	1922	1922	..	3-4	..				

Sendai Class	Jintsu . Naka . Sendai .	5195	47½	15½	90,000 (G.)	Kawasaki { Yokohama Nagasaki	1923 1925 1923 1924	2 —	..	7 5.5-in., 2 3-in. A.A., 5 M., 1 seaplane, 1 catapult, 80 mines	4 21-in. a.w. (D.)	33.0	300 1260	450
	Kiso . Kitakami .					{ Nagasaki Sasebo .	1920 1921 1920 1921							
Kuma Class	Kuma . Oi . Tama .	5100	47½	15½	70,000 (G.)	{ Sasebo . Kobe . Nagasaki (Mitsubishi)	1919 1920 1921 1920 1921	2 —	..	7 5.5-in., 2 3-in. A.A., 6 M. A.A., 1 seaplane, 80 mines	4 21-in. a.w. (D.)	33.0	300 1260	439
Tenryu Class	Tatsuta . Tenryu .	3230	40¾	13	51,000 (G.)	{ Sasebo . Yokosuka	1918 1919	..	..	4 5.5-in., 1 3-in. A.A., 2 M., fitted for minelaying, 1 seaplane	2 18-in. (T.)	31	— 900	332
—	Yubari .	2890	39½	11¾	57,000 (G.)	Sasebo .	1923	..	..	6 5.5-in., 1 3-in. A.A., 2 M. 34 mines	2 21-in. a.w. (D.)	33	— 820	328
I.e. I.e.	Ning Hai* Ping Hai*	2500	..	..	..	..	..	..	..	6 5.5-in., 6 3.5-in. A.A.	{ 4 21-in.	23	..	..

MINELAYERS.—Katsuriki (1917), 1540 tons, 13 knots, 3 3-in., 150 mines; Itsukushima (Uraga, 1929), 1970 tons, 16 knots, 3000 H.P. (Diesel), 3 5.5-in., 2 3-in. A.A., 250 mines; Tokiwa, 9240 tons, 21 knots, 2 8-in., 8 6-in., 3 3-in., and 19 smaller vessels, 300—400 tons, about 12 knots, 2 3-in., 45 mines. Okinoshima (1936), 4400 tons, 9000 H.P., 20 knots, 4 5.5-in., 4 m.g.; Shirakami, Aotaka, Hatsutaka, Sokuten, Narifu, Sumiau, Kyosai, Kunaziri, Isakuyi (1939), 720 tons, 20 knots, 2 4.7-in. MINESWEEPERS.—Nos. 1, 2, 3 (1923), No. 4 (1925), and Nos. 5, 6 (1929), 615 tons, 20 knots, 2 4.7-in., 1 3-in. A.A. Nos. 7—12 (1939) 630 tons, 20 knots, 3 4.7 in., 2 M. Nos. 13—14 (1933), and Nos. 15—18 (1935-36), 492 tons, 20 knots, 2 4.7-in. guns. GUNBOATS.—Saga (1912), 685 tons, 15 knots, 1 4.7 in., 3 3-in. A.A.; Ataka (1922), 725 tons, 16 knots, 2 4.7-in. A.A.; Yodo, 1320 tons, 22 knots, 2 3-in. RIVER GUNBOATS.—Futami (1930), Atami (1929), 170 tons, 16 knots, 1 3-in. gun; Katada, Hira, Hodzu, Seta (1923), 305 tons, 16 knots, 2 3-in. A.A.; Toba (1911), 215 tons, 15 knots, 2 3-in.; Kotaka (1930), 50 tons, 15 knots, 5 m.g.; Fushimi (1939), 320 tons, 16.5 knots, 1 3-in. A.A. SUBMARINE DEPOT SHIPS.—Taigei (1934), 10,000 tons, 689 feet, 13,000 H.P., 20 knots, 4 5-in. A.A.; 1 seaplane; Chogei (1924), Jingei (1923), 5160 tons, 16 knots, 4 5.5-in., 2 3-in. A.A. 1 seaplane; Komahashi (1914), 1125 tons, 13.9 knots, 2 3-in., 1 3-in. A.A.; Karasaki (1896), 9750 tons, 13 knots, 1 3-in., 1 3-in. A.A. ANTI-SUBMARINE NETLAYERS.—Yayeyama (1932), 1135 tons, 4800 H.P. (reciprocating machinery), 20 knots, 2 4.7-in. A.A.; Shirataka (1929), 1345 tons, 16 knots, three 4.7 in. A.A. guns. Tsubame and Kamome (1929), 450 tons, 19 knots, 1 3-in. Natsushima, Sarusima and Nasami, 443 tons, 19 knots, 2 3-in. guns. SUBMARINE CHASERS.—Nos. 1, 2, 300 tons, 24 knots, 4 m.g.; Nos. 4-13, 270 tons, 20 knots, 4 m.g.; 51-53, 170 tons, 23 knots, 4 m.g. REPAIR SHIP AND SUBMARINE SALVAGE SHIP.—Asahi (ex-Battleship, 12,000 tons), 18 knots, 2 5-in. Repair Ship—Akashi (1933), 9000 tons, 19 knots, 4 5-in. A.A. 4 Salvage Ships. 2 Cable Ships. Transports and other auxiliaries. ICEBREAKER.—Odumari (1921), 2330 tons, 13 knots, 1 3-in. TARGET SHIP—Settau, 16,130 tons. ARMED OILERS.—Takasaki and Tsurugisaki (1937), 12,060 tons, 19 knots, 4 5-in. guns. Naruto, Hayayomo, Ondo, Iro, Tsurumi, Shiriya, Sata, Erimo (1920-23), 14,050 tons, 12 knots, 2 5.5-in., 2 3-in. A.A. Sunosaki (1918), 8800 tons, 14 knots, 2 4.7 in., 2 3-in. A.A. SURVEYING SHIP.—Koslin, 2080 tons, 10.3 knots, 2 3-in. TRAINING SHIPS.—Shikishima, 11,275 tons; Fuji, 9,179 tons; Katori, Kashima (1940), 6800 tons, 18 knots, 4 5.5-in., 2 5-in. A.A., B.M.G., 4 24-in. T.T. TRANSPORTS.—Mamiya, 15,820 tons, 14 knots, 2 5.5-in., 2 3-in. A.A.; Muroto, Noshima, 8,215 tons, 12½ knots, 2 4.7-in.; Naruto, Hayatomo, Ondo, Iro, Tsurumi Shiriya, Sata, and Erimo (1920-22), 14,050 tons, 2 5.5-in., 2 3-in. A.A. AUXILIARY CARRIERS (MERCHANT SHIP CONVERSIONS).—Kagu Maru, Kamikawa Maru, Kinugasa Maru, 6,800 tons, 17 knots; Takyu Maru, Yagasa Maru.

* ex-Chinese.

For Destroyers, Torpedo Boats and Submarines, see *Flotilla Tables*.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour.						Armament.		Speed.	Complement.		
											Belt.	Deck.	Side above Belt.	Bulkhead.	Heavy Guns.	Second-ary.	Guns.	Torpedo Tubes.		Fuel.	Coal.	Oil.
cr.	De Ruyter	6450 tons.	560	51	16	66,000 P.T. Y.	Rotterdam (Wilton-Fijenoord) (Flushing)	1935	1936	£ ..	in. 2	in. 1½	in. ..	in. ..	in. ..	7 5-9-in., 10 1-5-in. A.A., 8 5-in. A.A.; 8 m., 1 catapult, 2 seaplanes	—	32	1000	435		
cr.	Java	6670	509½	52½	18	72,000 tur.	Amsterdam	1921	1925	..	3	1	1	..	4	..	—	31	—	525		
"	Sumatra.	530	172½	28	9½	1500 Diesel	Amsterdam	1920	1926	..	2	3	..	..	..	4 4-1-in., 2 m.	—	14	34	63	
a.g.b.	Brinio	530	172½	28	9½	1500 Diesel	Amsterdam	1912	1914	..	K.S.	3	..	..	10	3	1 9-4-in., 4 5-9-in., 2 3-in., 6 1-pr., 2 m.	—	16.5	710	302
"	Gruno	4371	317	50	19	6282½ Y.	Amsterdam	1913	1915	..	H.N.S. 6-4	2	..	..	10	4	2 11-in., 2 3-in., 8 1-5-in., 2 m.	—	16	880	180
c.d.s.	Hertog Hendrik *	4371	317	50	19	6282½ Y.	Amsterdam	1902	1904	347,500	H.N.S. 6-4	2	..	..	..	..	8 4-7-in., 4 3-in., 3 1-5-in., 6 m.	—	18	900	325
"	Soerabaja *	5644	333	56	20½	8000 Y.	Amsterdam	1909	1910	..	4	2	..	..	..	..	6 5-9-in., 4 1-5-in. A.A., 2 seaplanes	—	—	—	206
"	Gelderland	3512	310	48½	17	9750 Recip.	Rotterdam	1898	1900	..	4	2	..	..	..	..	4 5-in., 2 seaplanes	—	—	—	860
"	Tromp	3350	433	40½	15	56,000 Y.	Amsterdam	1937	1938	..	2	1	..	..	..	..	—	—	—	—	—

* Training ships.

GUNBOATS.—Soemba, Flores (1926-7), 1457 tons, 15 knots, three 5-9 in., one 3-in. A.A., 2 m.
 MINELAYERS.—Nautilus (1930), 800 tons, 14 knots, two 3-in., three 1-5-in., 2 m., 40 mines; Douwe Ankes (1922), 687 tons, 13 knots, three 3-in. A.A., 2 m., 130 mines; Medusa (1911), 598 tons, 11-5 knots, three 3-in., 1 m., 65 mines; four old vessels, 240 tons, 7 knots, two 1-5-in. Wilten Van Der Zaan, 1350 tons, 15 knots, 2 4-7-in., 4 1-5-in., 4 m., 120 mines; Krakatau (1924), 982 tons, 16 knots, two 3-in. A.A., 4 m., 150 mines, 1 catapult, and 1 seaplane; Pro Patria (1923), 534 tons, 10 knots, one 3-in. A.A., 3 m., 80 mines; Prins Van Oranje and Gouden Leeuw (1932), 1291 tons, 15 knots, two 3-in., two 1-5-in., 2 m., and 1 aircraft; Serdaug, 680 tons, 13 knots, 2 1-pr.; Jan Van Brakel (1936), 1330 tons, 15 knots, 2 8-in., 1 1-pr., 4 m.

MINESWEEPERS.—L-III., 200-235 tons; A, B, C, D (1930), 179 tons; Eland Dubois, Jan Van Amstel, Abraham van Der Hulst, Jan van Gelder, Pieter Florisz, Abraham Crijnsen, Pieter de Bitter (1937), 525 tons, 15 knots, 1 3-in., 4 m.

SURVEYING VESSELS.—Tydeman (1919), 1160 tons, 10 knots, 1 3-in., 2 1-5-in., 2 m.; Willebord Snellius (1929), 930 tons, 10½ knots, 1 3-in., 2 1-5-in., 2 m.; Eilerts de Haan (1919), 312 tons, 12 knots; Hydrograf (1911), 260 tons, 9 knots.

SUBMARINE DEPOT SHIP.—Cornelius Drebbel (1915), 688 tons, 170 h.p. (Diesel), 6 knots, 1 1-5 in.

GUNNERY TRAINING SHIP.—Van Kinsbergen (1939), 1760 tons, 25 knots, 4 4-7-in. guns.

OLD GUNBOATS (1877-9): Hefring, Braga, Tyr and Freyr, 244 tons, 7-8 knots, 1 4-7-in., 2 1-pr., 1 m.

POLICE AND CUSTOMS VESSELS.—Seventeen in No., armed with 2 3-in. guns, 12-20 knots, 600-1000 tons.

MOTOR TORPEDO BOATS.—T.M. 1, 2, 4 (1929) Thornycroft, 12 tons, 37 knots, 4 m., 2 17-7-T.T.; T.M. 3-8 (1937), 15 tons, 38 knots, 2 m., 4 18-in. T.T.; T.M. 51 (1939), 37 tons, 43 knots, 2 m., 4 18-in. T.T.

* Under the control of Germany.
 For Destroyers, Torpedo Boats and Submarines, see Flotilla Tables.

NORWAY.*

Class.	NAME.	Normal Displacement.	Length. (Extreme).	Beam.	Draught.	Horse-Power.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour.					Armament.		Speed.	Fuel.		Complement.
											Belt.	Deck.	Side above Belt.	Bulkhead.	Heavy Guns.	Gun Position.	Torpedo Tubes.		Coal.	Oil.		tons.
c.d.s.	Harald Haarfagre.	3858	304	48½	17½	4500	Elswick	1896	1898	300,000	2	in.	..	..	8	in.	2 8-2-in., 6 3-in.	3	16.5	550	249
"	Tordenakjold							1897	1899		7 H.A.	2	..	..	H.A.	2 8-2-in., 6 4-7-in., 2 8-in. A.A., 6 M. (sub.) 18-in.	2	18-in.	2	18-in.	—

FISHERY PROTECTION VESSELS.—Nordkapp (1937), 273 tons, 13.7 knots, 1-1.85-in.; Heimdal (1892), 660 tons, 12 knots, four 12-pr.

MINELAYERS.—Glommen and Laugen (1918), 335 tons, 9½ knots, 2 3-in. M., 50 mines; old gunboats, refitted as minelayers: Tyr, Gor, Vidar, Brage, Nor, Valø, and Uller, 280-280 tons, armed with one 4-7-in. and other guns. Olav Trygrason,† minelayer and training ship, built at Horten, 1747 tons, 21½ knots, 6000 H.P., 4 4-7-in. and 1 3-in. A.A. guns, and 2 T.T.s. (18-in.), 280 mines.

MINESWEPPER.—Otra, 360 tons, 13.5 knots, one 1.5 in., 2 M.

* Under the control of Germany.

† 1500 H.P. Diesels, 4500 H.P. turbines. Max. speed on Diesels, 14 knots.

For Destroyers, Torpedo Boats and Submarines, see Flotilla Tables.

SOVIET UNION.—Battleships.

Class.	NAME.	Normal Displacement.	Length. (Extreme).	Beam.	Draft.	Horse-Power.	Where Built.	Makers of Engines.	Date of Launch.	Date of Completion.	Cost.	Armour.						Armament.		Speed.	Fuel.		Complement.
												Belt.	Deck.	Side above Belt.	Bulkhead.	Heavy Guns.	Gun Position. Second-ary.	Guns.	Torpedo Tubes.		Coal.	Oil.	
b.	Paris Commune (ex-Sevastopol) †	23,000	594	87	27½							in.	in.	in.	in.	in.	12 12-in., 16 4·7 in., 10 3-in. A.A., 8 m., and smaller, 2 seaplanes	4	23	2000	1000	1125	
b.	October Revolution (ex-Gangut) †	23,000	594	87	27½	42,000 P.T.	{ Baltic Works	{ Baltic Works	1911	1915	..	9·5	3	..	12-10	6							
b.	Marat (ex-Petro-parlovak) *	23,806	594	87	31																		
b.	Mikhail Frunze	23,000	594	87	27½				1911	1915													
b. I.	: : :	40,000	800	105					Blg.								9 16-in., 12 6-in.		30				
b. II.	: : :																						
b. III.	: : :																						

† Modernised, 1937.

|| Modernised, 1933.

* Modernised, 1931.

Seaplane Carrier.

Stalin (building), 12,000 tons, 30 knots, 22 aircraft.

Class.	NAME.	Normal Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power.	Where built.	Date of Launch.	Cost.	Armour.		Armament.		Speed.	Fuel.	Complement.
										Belt.	Gun Position.	Guns.	Torpedo Tubes.			
cr.	Aurora†	6730	416	55	21	11,600	Petrograd	1900	£ ..	in. ..	in. ..	10 5.1-in., 5 6-pr. A.A., 2 M., 125 mines	2	knots, 18	tons, 964	573
m. cr.	Marti.	3500	410	..	..	G. Tur.	..	..	..	2	..	4 5.1-in., 3 3-in. A.A., 300 mines	..	25	..	..
cr.	Chervonaya - Ukral-na (ex-Ad. Nakhimov)	7600	520	50½	18½	55,000 P.T.(Y.)	Nikolaev	1915	..	3	..	15 5.1-in., 4 3-in. A.A., 4 M., 100 mines, 2 flying boats	12 21-in.	29½	540	600
"	Komintern†	6675	440	54½	20½	19,500	Nikolaev	1903	..	1	..	10 5.1-in., 8 3-in. A.A., 1 aircraft	2 (sub.)	23	1190	595
"	Krasni Kavkaz (ex-Ad. Lazarev)	7600	535	51½	19	60,000	Nikolaev	1916	..	3	3	4 7.1-in., 4 3-in. A.A., 4 4-in. A.A., 4 M., 100 mines, 2 seaplanes	(a.w.)	29½	540	650
"	Krasny Krym (ex-Profintern)	7200	520	50½	18½	55,000 P.T.(Y.)	Reval	1915	..	3	3	15 5.1-in., 4 4-in. A.A., 4 3-in. A.A., 2 aircraft, 100 mines	12 21-in.	29½	540	630
"	Kirov.	7725	613½	58	18	105,000	Leningrad	1936 1937 1938 1939	..	3	..	9 7.1-in., 4 4-in., 4 1.5-in. A.A., 2 aircraft	6 21-in.	34	..	624
"	Maxim Gorki	7725	613½	58	18	105,000	Leningrad	1937 1938 1939	..	2	..	6 5.1-in., 6 1.8-in. A.A., 6 M.	9 21-in.	39	..	..
"	Ordzhonikidze	7725	613½	58	18	105,000	Leningrad	1937 1938 1939	..	..	..	7.1-in. guns	9 21-in.	39	..	..
"	Kuibishev	7725	613½	58	18	105,000	Leningrad	1937 1938 1939	..	..	..	7.1-in. guns	9 21-in.	39	..	..
1. cr.	Tashkent	3000	457½	43	11½	100,000	Leghorn	1937	..	..	..	7.1-in. guns	9 21-in.	39	..	..
cr.	THREE IN NUMBER.					G. Tur.	..	Bldg.	..	..	..	7.1-in. guns	9 21-in.	39	..	..

GUNBOATS.—Krasni Vostok, Sun Yat Sen, Lenin, Chicherin, (1910), 950 tons, 11 knots, 1 6-in., 1 3-in.; Bednota, Krasnoe-Znamya, Rabochi, Proletarii, Krasni Buryat, Krasni Mongol, Krasni Moryak (1907), 11 knots, 190 tons, 2 4.7-in.; Krasni Azerbaizhan, Lenin (1909), 640 tons, 12 knots, 2 4-in., 2 3-in.; Krasni Adzharistan, Krasni Krim, Krasnaya Gruzija, Krasnaya Abkhazia (1906), 1,100 tons, 9 knots, 2 5.1-in., fitted for minelaying; Altvater, Bakinsky Rabotchi, Markin (1905), 710 tons, 25 knots, 3 4-in., 2 M.; Krasnaya Zvezdo (1906), 1,300 tons.; Krasnoe Znamya (1895), 1,500 tons, 5 5-in., 2 3-in.; Karjala (1918), ex-Finnish, 350 tons, 14 knots, 2 3-in.; Yrjo and Aunus (ex-Finnish), 10 knots, 2 3-in.; Udmurick (1917), 185 tons, 10 knots, 1 3-in.; Nos. I-VI (1935), 400 tons, 16 knots, 1 4-in., 1 M.G.; Lahna and Kuore (1937), ex-Finnish, 16 tons, 10 knots; Fugas, Kapsul, Minrep, Paravan, Podsekatez, Provodimir, Strela, and others (1933-40), 500 tons, 16 knots, 1 4-in., 1 1.7-in.

MINELAYERS.—25 Oktjabrya (1873), 4,500 tons, 11 knots, 4 3-in., 600 mines; 12 others.

ICE-BREAKERS.—Josef Stalin, Kaganovitch, O. Schmidt (1938-40), 11,000 tons, 15 knots, 3 seaplanes.; Lenin, 5,700 tons, 19 knots; Krassin (1917), 10,000 tons, 15 knots; Sadko (1913), 1,616 tons, 14 knots.; Maligin (1912), 1,535 tons; Sedov, Rusamov, Sibirjakov (1909), 1,140 tons, 12 knots.; Truvor (1896), 1,450 tons, 13 knots; Davidov, 1,525 tons, 15 knots; Dobriynia Nikitich (1916), 1,664 tons; Feodort Litke (1909), 3,000 tons, 17 knots; V. Molotov (building); S. Makarov (1916), 4,000 tons, 14 knots; Yermak (1898), 8,000 tons, 14 knots; 30 others.

DERFOT SHIPS.—Krasni Gorn (1911), 1,892 tons, 11 knots; Serp-I-Molot (1900), 6,000 tons, 11 knots.; Smolni, 3,200 tons, 10 knots; Kommuna (1913), 2,400 tons, 10 knots; Sovetskaya Rossiya, 5,200 tons, 12 knots; Oka (1914), 1,982 tons, 10 knots.

TRAINING SHIPS.—Svir, 10,000 tons gross, 15 knots; Martinov, Osovaikhim, Artemev, Kursant, Ucheba, Praktika (1907), 300 tons; Komsomolets (1902), 11,000 tons, 18 knots, 4 3-in.; Amur, 3,000 tons, 13 knots, 1 4.7-in.; Leningrad Soviet (1895), 1,300 tons, 10 knots.

GUARDSHIPS.—Razvedchik (1904), 100 tons, 16 knots, 2 3-pr.; Dzerzhinski, Kirov (1934), 800 tons, 20 knots, 2 4-in., 4 1.5-in. A.A.; Five vessels, 200 tons, 16 knots, 1 4.7-in. Eight vessels, 350 tons, 20 knots, 1 4.7-in.

WATERTANKERS.—Vodolez I and II, 660 tons, 9½ knots.

PATROL VESSELS.—Khorek, Kunitsa, Laska, Vidra (1936-37), 180 tons, 12 knots, 2 3-in.; 40 others.

2 FISHERY PROTECTION VESSELS.

For Flotilla Leaders, Destroyers, Guardships and Submarines, see Flotilla Tables.

4 SALVAGE VESSELS.

† Training ship.

SPAIN.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draft.	Horse-Power. Type of Machinery.	Where Built.	Date of Completion.	Coal.	Armour.		Guns.	Torpedo Tubes.	Speed.	Fuel.	Complement.
										Side Deck.	Gun Position.					
cr.	Canarias.	10,000	636	64	17' 4"	90,000 P.T. (G.)	Ferrol.	1931	1934	4	1	8 6-in., 8 4 7-in. A.A., 2 seaplanes; 1 catapult	4 21-in. (T.)	33.0	2750	765
"	Miguel de Cervantes.							1928	1930	8	..	8 6-in., 4 4-in. A.A., 2 8-pr., 1 M.	4 21-in. (T.)	33.0	1680	560
"	Almirante Cervera.	7475	579½	54	16½	80,000 P.T. (G.)	Ferrol.	1925	1928	1	..	4 8 5-in. A.A., 4 M., 1 L.	4 21-in. (T.)	25.5	1200	404
"	Galicia, ex-Libertad (ex-Principe Alfonso)							1925	1927	3-1½	3	4 8 5-in. A.A., 4 M., 1 L.	4 21-in. (T.)	25.5	1200	404
"	Navarra, ex-Republica (ex-Reina Victoria Eugenia)	4857	462	50	15½	25,500 P.T.	Ferrol.	1920	1923	1½	..	6 6-in., 4 1 9-in. A.A., 4 M.	4 21-in. (T.)	29	800	320
"	Mendez Nuñez	4509	462	46	14½	45,000 (G.)	Ferrol.	1922	1924	1	..	4 4-in., 2 1 9-in. A.A., 2 M.	..	15	324	220
g.b.	Dato							1928	1925	..	..	4 4 7-in., 4 5-in. A.A. M.	..	20	..	140
"	Canalejas	1314	251½	33½	11½	1700 tur.	Ferrol.	1922	1924	..	..	..	..	..	..	..
"	Canovas del Castillo	(normal)						1922	1923	..	..	..	..	..	..	..
"	Calvo Sotelo	1600	282	39½	11	6500 tur.	Cadiz.	1984	1988	..	..	..	..	..	..	..

SAILING TRAINING SHIPS.—Juan Sebastian de Elcano (1928), 3500 tons, 800 H.P. (Diesel), 9.5 knots, 4 2-4-in.; Galatea (ex-Clarastella) (1903), 2710 tons, 8½ knots, 4 2-24-in.

OILER.—Pluton, 7000 tons, 13 knots. Two building.

SURVEY VESSELS.—Tofino, Malaspina, 1200 tons, 12 knots, 2 4-in.

ARMED TRAWLERS.—Alcazar, Larache and Tetuan, 400 tons, 10 knots, 1 3-in. (also 2 3-pr. in Alcazar); Arula, 510 tons, 10½ knots, 2 3-in.; Uad Martin, Uad

Muluya, 420 tons, 10 knots, 1 3-in.; Uad Quert, Xauen, 380 tons, 10½ knots, 1 3-in.

FISHERY PROTECTION VESSELS.—8 in number, 160 tons, 11 knots, 1 6-pr.

MINELAYERS.—Jupiter, Marte, Neptuno, Vulcano, 2100 tons, 18½ knots, 4 4-7-in. A.A., 4 M.G., 264 mines, 2 depth charge release gears; Eolo, Triton, 1700

tons, 18.5 knots, 4 4-in., 4 1.5-in., 4 M.G., 100 mines.

TRANSPORT.—Contramaestre Casado, 7275 tons, 10½ knots, 4 1.6-in.

Tuos.—Cartagenero, Ferrolano, Geditano, 300 tons, 10 knots, 1 6-pr.; Galicia, 360 tons, 10 knots, 1 3-in.; Ciclope, 800 tons, 12 knots, 1 3-in.

Three coastguard patrol vessels, 280 tons, ordered and four others building.

MOTOR TORPEDO BOATS.—Twenty in number.

For Destroyers, see ~~Spain~~ Boats and Submarines.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power.	Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour.				Armament.		Speed.	Fuel.	Complement.
												Belt.	Deck.	Slide above Belt.	Bulkhead.	Gun Position.	Guns.	Torpedo Tubes.		
e.d.s.	Two in number	8000	436	64	10½	..	..	Bldg.	..	..	£	in.	..	..	in.	in.	4 10-in., 6 4-7-in., 8 1-5-in. A.A.	..	knots.	tons.
l.c.	Two in number	7000	..	..	..	..	..	Bldg.	..	..	..	..	..	..	..	..	..	..	22	..
"	Aran.	3361	287	49½	16-7	7000	Y. t	Gothenburg	1901	1902	..	7	1½	..	..	7½	2 8-3-in., 6 5-9-in., 10 6-pr., 1 1-pr.	2	17-2	300
"											K.S.	K.S.	..	..	..	K.S.	sub. 18-in.	£	287	—
"	Drottning-Victoria*	7100	396-7	61	21½	22,000	(G.) Y.	Gothenburg	1917	1921	666,000	8-6	1½	4	..	8	4 11-in., 8 5-9-in., 4 3-in., 2 6-pr., 6 M.	—	23-0	690
l.cr.	Fylgia	4200	378	48	6-20	612,444	Y. t	Stockholm	1905	1907	385,700	4	2	..	..	5	8 5-9-in., 4 2-2-in., 4 1-5-in.	2	22-7	900
											K.S.	K.S.	..	..	..	K.S.	sub. 18-in.	£	328	—
Hangar Cruiser	Gotland	4700	442	50	6-14	7-39,000	(G.)	Gothenburg	1933	1934	910,000 (estimated)	..	..	..	..	..	6 6-in., 4 3-in. A.A., 4 M., 100 mines, 11 seaplanes, 1 catapult, 100 mines	6	27-0	oil
e.d.s.	Gustav V.*	7100	396-7	61	21½	22,000	(G.) Y.	Malmö	1918	1922	666,000	8-6	1½	4	..	8	4 11-in., 8 5-9-in., 4 3-in. A.A., 2 6-pr., 6 M.	—	23-0	690
"	Manligheten	3361	287	49½	17-4	7400	Y.	Malmö	1903	1904	..	7	1½	..	..	7½	2 8-3-in., 6 5-9-in., 8 6-pr., 1 1-pr.	2	17-0	900
"											K.S.	K.S.	..	..	..	K.S.	sub. 18-in.	—	300	—
"	Oscar II.*	4250	313-6	50-5	18	9000	Y.	Gothenburg	1905	1907	..	6	2	6	6	7½	2 8-3-in., 6 5-9-in., 8 6-pr., 1 1-pr.	2	18-0	500
"											K.S.	K.S.	..	..	..	K.S.	sub. 18-in.	—	330	—
"	Sverige*	6899	392-7	61	21½	20,000	tur. Y.	Gothenburg	1915	1917	666,000	8-6	1½	4	..	8	4 11-in., 8 5-9-in., 4 3-in., 2 6-pr., 6 M.	—	22-5	690
"	Tapperheten	3361	287	49½	17-7	6000	Y.	Malmö	1901	1903	..	7	1½	..	..	7½	2 8-3-in., 6 5-9-in., 10 6-pr., 1 1-pr.	2	16-5	300
"											K.S.	K.S.	..	..	..	K.S.	sub. 21-in.	—	287	—

MINELAYER.—Ulas Fleming, 1570 tons, 44-7-in., 4 M., 20 knots, 200 mines. DEPOT SHIPS FOR SUBMARINES.—Svea (1886), 2795 tons, 15 knots, 2 1-5 A.A.; 1 building, 2000 tons. PATRICIA (1926), 3000 tons, 14 knots. ICEBREAKERS.—Atle, 1720 tons, 16 knots, 2 2-2 in.; Ymer, 3450 tons, 18 knots, 4 3-in. Three building.

AIRCRAFT DEPOT SHIP.—Dristigheten (1901), 3218 tons, 16 knots, 4 3-in. 3 aircraft. DEPOT SHIPS.—Niord (1898), 3397 tons; Göta, 3350 tons; Jacob Bagge, Örn, 738 tons, 20 knots, 2 4-7-in., 2 2-2 in.

SAILING TRAINING SHIPS.—Af Chapman (1888), Falken (1877), Najaden and Jarramas (1900), 350 tons. VEDETTE BOATS (used for minelaying and minesweeping).—Kaparen, Jagaren, Snapphanen, Vaktaren, 290 tons, 24 knots, 2 3-in., 2 1-in. A.A. Altair, Argos, Antares, Arcturus, Iris, Perseus, Polaris, Regulus, Rigel, Spica, Thetis, Vega, Vesta (1908-11), 105 tons, 20 knots, 2 2-2 in., 1 18-in. T.T.; Castor, Pollux (1909), 105 tons, 20 knots, 2 1-5-in., 1 18-in. T.T.; No. 19 (1914), 55 tons, 10 knots; Nos. 27, 28, 30, 33, 34, 35, 36 (1900), 50 tons, 17 knots, 2 1-5-in., 1 15-in. T.T. Nos. 5-9 (1907), 50 tons, 11 knots 1 1-5-in., 2 18-in. T.T.

MOTOR TORPEDO BOATS.—Nos. 3 and 4, 55 feet, 11 tons, 900 H.P., 41 knots, 1 M., 2 18-in. T.T. 4 others. TENDERS.—Sokaren, Sprevaren, Sprangaren, 160 tons, 10 knots 1 6-pr.

MINESWEEPERS.—Starkodder, Styrbjörn, 350 tons, 15 knots, 2 1-5-in.; M. 1 and 2, 60 tons, 16½ knots, 2 M.O.; Holmon, Vinga, Ven, Ramskar, Kullen, Arholma, Landsort (1939-40), 370 tons, 17½ knots, 2 3-in. 1 M.O. A number building.

For Destroyers and Submarines, see Flotilla Tables.

* Reconstructed and modernised (1929-39).

UNITED STATES.—Battleships.

Class.	NAME	Standard Displacement.	Length. (Extreme.)	Beam.	Draft.	Horse-Power.	Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost, \$	Armour.					Armament.		Speed.	Fuel.	Complement.	
												Belt.	Deck.	Side above Belt.	Bulkhead.	Heavy Guns.	Gun Position.	Torpedo Tubes.				Guns.	Gun.
b.	Montana .	58,000	..	..	..	..	..	Philadelphia	Blg.	..	..	in.	in.	in.	in.	..	..	..	..	..	..
b.	Ohio .							Philadelphia	Blg.	..		in.	in.	in.	in.	in.	..	..	..	..	..
b.	Maine .							New York (Navy Yard)	Blg.	..		..	..	..	..	..	..	..	..	..	..
b.	New Hampshire	45,000	..	..	..	..	..	New York	Blg.	..	..	in.	in.	in.	in.	..	..	..	..	..	..
b.	Louisiana							New York (Navy Yard)	Blg.	..		..	..	..	..	..	..	..	..	..	..
b.	Illinois .							Norfolk	Blg.	..		..	..	..	..	..	..	..	..	..	..
b.	Kentucky	45,000	..	..	..	..	..	Philadelphia	Blg.	..	..	in.	in.	in.	in.	..	..	..	..	..	..
b.	Iowa .							Norfolk	Blg.	..		..	..	..	..	..	..	..	..	..	..
b.	New Jersey							New York (Navy Yard)	Blg.	..		..	..	..	..	..	..	..	..	..	..
b.	Missouri .	45,000	880	108	36	..	..	Philadelphia	Blg.	..	..	in.	in.	in.	in.	..	..	..	..	..	..
b.	Wisconsin							New York (Navy Yard)	Blg.	..		..	..	..	..	..	..	..	..	..	..
b.	Washington							Philadelphia	Blg.	..		..	..	..	..	..	..	..	..	..	..
b.	North Carolina	35,000	750	108	28	70,000	..	New York	1940 1941	..	17,500,000	in.	in.	in.	in.	..	..	..	..	..	..
b.	Indiana							New York	1940 1941	..		in.	in.	in.	in.	in.	..	..	..	..	..
b.	Massachusetts							Newport	1941	..		in.	in.	in.	in.	in.	..	..	..	..	..
b.	Alabama	26,100	562	106	26	30,000 P. tur.	..	Bethlehem	Blg.	1911 1912	964,000	11-5 k.s.	3	..	8-6 k.s.	11 k.s.	6½	12 12-in. (50 cal.), 16 5-in. (51 cal.), 8 3-in. (50 cal.) A.A., 2 3-pr., 8 m., 1 catapult, 3 float-planes	—	20·5	5100	670
b.	South Dakota							Norfolk	Blg.	1911 1912		11-5 k.s.	3	..	8-6 k.s.	11 k.s.	6½	12 12-in. (50 cal.), 16 5-in. (51 cal.), 8 3-in. (50 cal.) A.A., 2 3-pr., 8 m., 1 catapult, 3 float-planes	—	20·5	5100	670
b.	Arkansas *							New York (S.B. Co.)	1911 1912	1911 1912		11-5 k.s.	3	..	8-6 k.s.	11 k.s.	6½	12 12-in. (50 cal.), 16 5-in. (51 cal.), 8 3-in. (50 cal.) A.A., 2 3-pr., 8 m., 1 catapult, 3 float-planes	—	20·5	5100	670

b. California	32,600,624	97½	30½	26,800 tur. electric drive	Mare Island (Navy Yard)	1919/1921	2,620,000	14-8	18	..	..	18	..	12 14-in. (50 cal.), 12 5-in. (51 cal.), 8 5-in. (25 cal.) A.A., 2 6-pr., 8 M., 2 catapults, 3 floatplanes	21	4636	1280
b. Colorado.	32,500,624	97½	30½	27,300 B. & W. tur. electric drive	New York (S.B. Co.)	1921/1923	1,383,000	13½-12	18	..	..	18	..	8 16-in. (45 cal.), 12 5-in. (51 cal.), 8 5-in. (25 cal.) A.A., 2 6-pr., 2 1-pr., 8 M., 2 catapults, 3 floatplanes	21	4570	1280
b. Idaho †	33,400,624	106½	29½	40,000 B. & W. P.T.	New York (S.B. Co.)	1917/1919	1,485,000	14	18	..	..	18	..	12 14-in. (50 cal.), 12 5-in. (51 cal.), 8 5-in. A.A., 2 6-pr., 8 M., 2 catapults, 3 floatplanes	21½	8271	1130
b. Maryland	31,500,624	97½	29½	27,300 B. & W. tur. (G.) and electric drive	Newport News	1920/1921	1,383,000	13½-12	18	..	..	18	..	8 16-in. (45 cal.), 12 5-in. (51 cal.), 8 5-in. (25 cal.) A.A., 2 6-pr., 8 M., 2 catapults, 3 floatplanes	21	4570	1230
b. Mississippi †	33,000,624	106½	29½	40,000 B. & W. C.T. (G.)	Newport News	1917/1917	1,485,000	14	18	..	..	18	..	12 14-in. (50 cal.), 12 5-in. (51 cal.), 8 5-in. A.A., 2 6-pr., 8 M., 2 catapults, 3 floatplanes	21	8271	1130

* Modernised 1926. Used as training ship.

† Modernised, 1934.

‡ The sums given in this column are exclusive of the cost of armour and armament according to the system of making appropriations in the estimates.

UNITED STATES.—Battleships—continued.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse Power. Type of Machinery.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour.					Armament.		Speed.	Fuel. Coal. Oil.	Complement.	
											Belt.	Deck.	Side above Belt.	Bulkhead.	Gun Position. Heavy Guns. Second-ary.	Guns.	Torpedo Tubes.				
b.	Nevada §.	29,000	583	108	27½	25,000 Y. P. tur.	Quincy, Mass. (Fore River)	1914	1916	1,211,342	13½-8 K.S.	1½-8	..	13½ K.S.	18-16 K.S.	..	10 14-in. (45 cal.), 12 5-in. (51 cal.), 8 5-in. (25 cal.) A.A., 2 6-pr., 8 M., 2 L., 2 catapults, 3 float-planes	—	20.5	— 2000	1100
b.	New Mexico †	33,400	624	106½	29½	40,000 B. & W. Electric drive	New York (Navy Yard)	1917	1918	1,485,000	14 K.S.	3	..	..	18 K.S.	..	12 14-in. (50 cal.), 12 5-in. (51 cal.), 8 5-in. A.A., 2 6-pr., 8 M., 2 catapults, 3 floatplane	—	21.5	— 3271	1140
b.	New York *	27,000	573	106	26	28,100 B. & W. recip.	New York (Navy Yard)	1912	1914	1,315,114	12-4 K.S.	8	9 K.S.	10 K.S.	14-8 K.S.	6 K.S.	10 14-in. (45 cal.), 16 5-in. (51 cal.), 8 3-in. (50 cal.) A.A., 2 8-pr., 8 M., 1 catapult, 3 floatplanes	—	21.0	— 5200	1230
b.	Oklahoma §	29,000	583	108	28½	25,300 B. & W. recip.	New York (S.B. Co.)	1914	1916	2,200,000	13½-8 K.S.	1½-8	..	13½ K.S.	18-16 K.S.	..	10 14-in. (45 cal.), 12 5-in. (51 cal.), 8 5-in. (25 cal.) A.A., 2 8-pr., 8 M., 2 catapults, 3 floatplanes	—	20.5	— 2000	1180
b.	Pennsylvania †	33,100	608	106½	28	40,000 B. & W. Cur. tur.	Newport News	1915	1916	1,485,000	14 K.S.	3	..	..	18 K.S.	..	12 14-in. (45 cal.), 12 5-in. (51 cal.), 8 5-in. (25 cal.) A.A., 2 8-pr., 8 M., 2 catapults, 3 floatplanes	—	21.0	— 2300	1180

b. Tennessee .	32,800 624	97½	30½	26,800 B. & W. Tur. electric drive.	New York (Navy Yard)	1919 1920 2,620,000	14-8 K.S.	3	..	18 K.S.	..	12 14-in. (50 cal.), 12 5-in. (51 cal.), 8 5-in. (25 cal.) A.A., 2 6-pr. 2 1-pr., 8 M., 2 catapults, 3 float- planes	2 21-in. (sub.) 21-in.	2 21-0	— 4656	1230
b. Texas*	27,000 573	106	26	28,100 recip.	Newport News	1912 1914 1,168,000	12-4 K.S.	3	9 K.S.	10 14-8 K.S.	6	10 14-in. (45 cal.), 16 5-in. (51 cal.), 8 5-in. (50 cal.) A.A., 2 8-pr., 8 M., 1 catapult, 3 float- planes	—	21-0	— 5200	670
b. West Virginia	31,800 624	97½	30	27,300 B. & W. tur. electric drive.	Newport News	1921 1923 1,883,000 13½-1	13½-1 K.S.	1	..	18 K.S.	..	8 16-in. (45 cal.), 12 5-in. (51 cal.), 8 5-in. (25 cal.) A.A., 2 6-pr., 2 1-pr., 8 M., 2 catapults, 3 floatplanes	2 21-in. (sub.) 21-in.	2 21-0	— 4670	1230

The battleship Wyoming was converted to a training ship (speed 18 knots) in 1931 in accordance with London Naval Treaty.

* Modernised in 1927. Modernisation included fitting of bulge protection, protection of decks against aerial attack, conversion to oil burning, installation of 3-in. A.A. battery, and addition of catapults. Cost about £600,000 each ship. Displacement increased about 3000 tons.

† Modernised in 1931. Modernisation included fitting bulges, reboiling, increasing elevation of turret guns, replacing former anti-aircraft batteries by 5-inch A.A. guns, new masts and new fire control.

‡ Taken in hand for modernisation 1931. New Mexico and Mississippi completed 1933. Idaho completed 1934. Modernisation includes fitting, increased deck protection, increasing elevation of turret guns, installation of eight 5-in. A.A. guns, reboiling, fitting of new turbines (the electric drive in New Mexico has been replaced by turbine machinery), alterations to masts and bridges, and fitting of bulges.

§ Modernisation in 1929. Alterations include fitting of bulges, deck protection, tripod masts, increasing elevation of turret guns, fitting a new 5-in. anti-aircraft battery. Oklahoma capsized during Japanese attack on Pearl Harbour, 7th Dec. 1941; reported to be repairable.

The modernisation of California, West Virginia, Colorado, Maryland, and Tennessee is projected.

UNITED STATES.—Aircraft Carriers.

Class.	NAME.	Standard Displacement. tons.	Length. (Extreme.) ft.	Beam. ft.	Draught. ft.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour.		Armament.		Speed. knots.	Fuel. Coal. Oil.	Complement.
											Deck.	Belt.	Gun.	Torpedo Tubes.			
A.C.	Wasp	14,700	739	80	20	(G.)	Bethlehem S. B. Co.	1939 Bldg.	1940	about 4,000,000	in.	in.	8 5-in., 18 1.1-in. M. A.A., 77 aircraft, 1 catapult	—	30	tons. Oil	..
A.C.	Randolph	{ Newport News S. B. Co. }	Bldg.
A.C.	Essex																
A.C.	Bon Homme Richard																
A.C.	Intrepid																
A.C.	Kearsage																
A.C.	Franklin	{ Bethlehem Steel, Fore River }	Bldg.
A.C.	Hancock																
A.C.	Cabot																
A.C.	Bunker Hill																
A.C.	Oriskany																
A.C.	Ticonderoga																
A.C.	Hornet	19,800	802	83	21½	{ 120,000 (G.) B. & W. }	Newport News	Bldg. 1936	1938	8 5-in. A.A. guns, 16 1.1-in. M. A.A., 76 aircraft, 1 catapult	—	34	Oil	1200
A.C.	Yorktown																
A.C.	Enterprise																
A.C.	Ranger																
A.C.	Lexington																
A.C.	Saratoga	33,000	888	105½	31	{ 180,000 tur.electric (W.F.) }	{ (Fore River) N.Y. Shipbuilding Co. }	1925	1927	9,000,000	3	6	8 8-in. (55 cal.), 12 5-in. (25-cal.) A.A. 12 M.G.; 2 6-pr. Operates about 80 landplanes. 1 catapult	—	33.9	7100	1927
A.C.	Langley†	11,500	542	65½	19	7,200 tur.electric (W.F.)	Mare Island Navy Yard	1912	1922 as aircraft carrier	4 8-in. (51 cal.), operates 7 landplanes	—	15	— 2000	411

† Formerly Collier Jupiter, converted 1937 into aircraft tender.

UNITED STATES.—Cruisers

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draught	Horse-Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost (exclusive of armament).	Armour.	Armament.	Torpedo Tubes.	Speed.	Fuel.	Complement.
		tons.	y.	y.	ft.					\$	Belt. Deck.	Guns.		knots.	tons.	
	Alaska	New York, S. B. Co.	Bldg.
	Guam															
	Philippines															
	Puerto Rico															
	Samoa	Bethlehem, Fore River	Bldg.
	Baltimore															
	Boston															
	Pittsburgh															
	St. Paul	New York, S. Co., Camden	Bldg.	12 6-in.
	Albany															
	Rochester															
	Columbus															
	Des Moines	Newport News S. B. Co.	Bldg.	12 6-in.
	Cleveland															
	Columbia															
	Montpelia															
	Denver	Newport News S. B. Co.	Bldg.	12 6-in.
	Amsterdam															
	Santa Fe															
	Tallahassee															
	Birmingham	Newport News S. B. Co.	Bldg.	12 6-in.
	Mobile															
	Biloxi															
	Vicksburg															

UNITED STATES.—Cruisers.—Continued.

Class.	NAME.	Standard displacement.	Length (Extreme).	Beam.	Draught.	Horse-power. Type of Machinery and Boilers.	Where built.	Date of Launch.	Date of Completion.	Cost (exclusive of armament).	Armour.		Armament.		Speed.	Fuel.	Complement.
											Belt.	Gun Position.	Guns.	Torpedo Tubes.			
	Flint	tons.	ft.	ft.	ft.					£	ins.	ins.			knots.	tons.	
	Pasadena	..	..	..	..	..	Bethlehem, Fore River	Bldg.	..	..	..	..	12 6-in.	..	..	..	..
	Springfield																
	Topeka																
	Providence																
	Manchester																
	New Haven																
	Huntington																
	Dayton						New York, S. B. Co.	Bldg.	..	..	..	..	12 6-in.	..	..	..	..
	Wilmington																
	Buffalo																
	Newark																
	Fargo						Federal, S. B. Co.	..	Bldg.	..	..	..	12 6-in.	..	..	..	..
	Cheyenne																
	Duluth																
	Miami																
	Wilkes-Barre																
	Oklahoma City																
	Little Rock																
	Galveston						Cramp, S. B. Co.	Bldg.	..	..	..	..	12 6-in.	..	..	..	..
	Youngstown																
	Phoenix						{ N.Y.S. Co., Camden	1938.		2,395,000							
	Boise						{ Newport News	1936.	1938	2,330,000	5		15 6-in., 8 5-in., 10 in., 4 seaplanes, 2 catapults	—	32½	2100	630
	Honolulu	10,000 estimated	600 (on w.L.)	61	6	100,000 (G.)	{ N.Y. Navy Yard	1937.			3						
	St. Louis				19	B. & W.	{ Newport News	1938	1939	..							
	Helena						{ N.Y. Navy Yard	1938									
Phoenix Class																	

[illegible]

UNITED STATES.—Cruisers.—Continued.

Class.	NAME.	Standard Displacement.	Length. (Extreme).	Beam.	Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Armour.		Armament.		Speed.	Fuel.	Complement.
										Belt. Deck.	Gun Position.	Guns.	Torpedo Tubes.			
Chester Class	Northampton	9050 tons	600 ft.	66 ft.	17-6	107,000 P.T. (G.)	Bethlehem S. B. Corp., Quincy	1929	1930	£ 2,180,000	in.	9 8-in. (55 cal.), 4 5-in. (25 cal.) A.A., 2 3-pr., 8 m., 2 catapults, 4-6 seaplanes	6 21-in. (T)	32½ knots	1500 tons	611
	Chester	9200	600 ft.	66	17-6	107,000 P.T. (G.)	American Brown Boveri Elec. Corp.	1929	1930	2,230,000	3 2	12 6-in. (53 cal.) (Cincinnati and Detroit, 10 6-in.) 4 3-in. (50 cal.) A.A., 2 3-pr., 2 catapults, 2 aircraft, 30 mines	6 21-in. (T)	33-7	1800	450
	Louisville	9050	600 ft.	66	17-6	107,000 P.T. (G.)	Puget Sound Navy Yard	1930	1931	2,290,000	3 2	12 6-in. (53 cal.) (Cincinnati and Detroit, 10 6-in.) 4 3-in. (50 cal.) A.A., 2 3-pr., 2 catapults, 2 aircraft, 30 mines	6 21-in. (T)	33-7	1800	450
Augusta Class	Chicago	9300	68 ft.	68	17-6	107,000 P.T. (G.)	Mare Island Navy Yard	1930	1931	2,280,000	3 2	12 6-in. (53 cal.) (Cincinnati and Detroit, 10 6-in.) 4 3-in. (50 cal.) A.A., 2 3-pr., 2 catapults, 2 aircraft, 30 mines	6 21-in. (T)	33-7	1800	450
	Houston	9050	65 ft.	65	17-6	107,000 P.T. (G.)	Newport Navy Yard	1929	1930	2,170,000	3 2	12 6-in. (53 cal.) (Cincinnati and Detroit, 10 6-in.) 4 3-in. (50 cal.) A.A., 2 3-pr., 2 catapults, 2 aircraft, 30 mines	6 21-in. (T)	33-7	1800	450
	Augusta	9050	66 ft.	66	17-6	107,000 P.T. (G.)	News S. B. & D. D. Co.	1930	1931	2,170,000	3 2	12 6-in. (53 cal.) (Cincinnati and Detroit, 10 6-in.) 4 3-in. (50 cal.) A.A., 2 3-pr., 2 catapults, 2 aircraft, 30 mines	6 21-in. (T)	33-7	1800	450
Omaha Class	Cincinnati	7050	55½ ft.	55½	13½	90,000 P.T. (G.)	Tacoma, Wash. Philadelphia (Cramp)	1921	1924	1,730,000 1,742,000	1½	12 6-in. (53 cal.) (Cincinnati and Detroit, 10 6-in.) 4 3-in. (50 cal.) A.A., 2 3-pr., 2 catapults, 2 aircraft, 30 mines	6 21-in. (T)	33-7	1800	450
	Concord	7050	55½ ft.	55½	13½	90,000 P.T. (G.)	Bethlehem S. B. Co. Quincy	1922	1923	1,584,000	3 1½	12 6-in. (53 cal.) (Cincinnati and Detroit, 10 6-in.) 4 3-in. (50 cal.) A.A., 2 3-pr., 2 catapults, 2 aircraft, 30 mines	6 21-in. (T)	33-7	1800	450
	Detroit	7050	55½ ft.	55½	13½	90,000 P.T. (G.)	Philadelphia (Cramp)	1923	1924	1,823,000	3 1½	12 6-in. (53 cal.) (Cincinnati and Detroit, 10 6-in.) 4 3-in. (50 cal.) A.A., 2 3-pr., 2 catapults, 2 aircraft, 30 mines	6 21-in. (T)	33-7	1800	450
Omaha Class	Trenton	7050	55½ ft.	55½	13½	90,000 P.T. (G.)	Philadelphia (Cramp)	1923	1924	1,810,000	3 1½	12 6-in. (53 cal.) (Cincinnati and Detroit, 10 6-in.) 4 3-in. (50 cal.) A.A., 2 3-pr., 2 catapults, 2 aircraft, 30 mines	6 21-in. (T)	33-7	1800	450
	Marblehead	7050	55½ ft.	55½	13½	90,000 P.T. (G.)	Tacoma, Wash.	1924	1925	1,838,000	3 1½	12 6-in. (53 cal.) (Cincinnati and Detroit, 10 6-in.) 4 3-in. (50 cal.) A.A., 2 3-pr., 2 catapults, 2 aircraft, 30 mines	6 21-in. (T)	33-7	1800	450
	Memphis	7050	55½ ft.	55½	13½	90,000 P.T. (G.)	Tacoma, Wash.	1924	1925	1,794,000	3 1½	12 6-in. (53 cal.) (Cincinnati and Detroit, 10 6-in.) 4 3-in. (50 cal.) A.A., 2 3-pr., 2 catapults, 2 aircraft, 30 mines	6 21-in. (T)	33-7	1800	450
Omaha Class	Milwaukee	7050	55½ ft.	55½	13½	90,000 P.T. (G.)	Tacoma, Wash.	1921	1923	1,823,000	3 1½	12 6-in. (53 cal.) (Cincinnati and Detroit, 10 6-in.) 4 3-in. (50 cal.) A.A., 2 3-pr., 2 catapults, 2 aircraft, 30 mines	6 21-in. (T)	33-7	1800	450
	Omaha	7050	55½ ft.	55½	13½	90,000 P.T. (G.)	Tacoma, Wash.	1920	1923	1,823,000	3 1½	12 6-in. (53 cal.) (Cincinnati and Detroit, 10 6-in.) 4 3-in. (50 cal.) A.A., 2 3-pr., 2 catapults, 2 aircraft, 30 mines	6 21-in. (T)	33-7	1800	450
	Baleigh	7050	55½ ft.	55½	13½	90,000 P.T. (G.)	Bethlehem & B. Co., Quincy	1923	1924	1,616,000	3 1½	12 6-in. (53 cal.) (Cincinnati and Detroit, 10 6-in.) 4 3-in. (50 cal.) A.A., 2 3-pr., 2 catapults, 2 aircraft, 30 mines	6 21-in. (T)	33-7	1800	450
Omaha Class	Richmond	7050	55½ ft.	55½	13½	90,000 P.T. (G.)	Philadelphia (Cramp)	1921	1923	1,742,000	3 1½	12 6-in. (53 cal.) (Cincinnati and Detroit, 10 6-in.) 4 3-in. (50 cal.) A.A., 2 3-pr., 2 catapults, 2 aircraft, 30 mines	6 21-in. (T)	33-7	1800	450
	Richmond	7050	55½ ft.	55½	13½	90,000 P.T. (G.)	Philadelphia (Cramp)	1921	1923	1,742,000	3 1½	12 6-in. (53 cal.) (Cincinnati and Detroit, 10 6-in.) 4 3-in. (50 cal.) A.A., 2 3-pr., 2 catapults, 2 aircraft, 30 mines	6 21-in. (T)	33-7	1800	450
	Richmond	7050	55½ ft.	55½	13½	90,000 P.T. (G.)	Philadelphia (Cramp)	1921	1923	1,742,000	3 1½	12 6-in. (53 cal.) (Cincinnati and Detroit, 10 6-in.) 4 3-in. (50 cal.) A.A., 2 3-pr., 2 catapults, 2 aircraft, 30 mines	6 21-in. (T)	33-7	1800	450

Class.	NAME.	Displacement.	Length. (Extreme).	Beam.	Draught.	Horse-power. Type of Machinery and Boilers.	Where built.	Date of Launch.	Cost (exclusive of armament).	Armour.	Armament.	Speed.	Fuel. Oil.	Complement.
Pensacola Class	Salt Lake City	9100	585½	65½	16	107,000 P.T. (G.)	New York S.B. Co. (Navy Yard, New York)	1929	3,400,000	Belt. Deck. In. Gun. Torped. Tubes.	10 8-in. (55 cal.), 4 5-in. (25 cal.) A.A., 2 3-pr., 8 m., 2 catapaults, 4 planes	32-7	3000	603
	Pensacola.							1929						

GUNBOATS.—Tulsa (1923), and Asheville (1920), 1,270 tons, 12 knots, 3 4-in., 23-pr., 3 1-pr.; Sacramento (1914), 1,140 tons, 12½ knots, 3 4-in., 2 3-pr., 2 1-pr.; Charleston, and Erie (1936), 2,000 tons, 20 knots, 4 6-in., 4 m.c., 1 seaplane; Dubuque and Paducah (1905), 1,000 tons, 13 knots, 4 4-in., 1 3-in.; Niagara, Vixen, St. Augustine, Jamestown, ex-Merchant Ships.

RIVER GUNBOATS.—Wake (ex-Guam) (1927); Tutulla (1928), 370 tons, 14 knots, 2 3-in., 10 m.

MINELAYERS.—Aroostook (1918), 4,200 tons, 20 knots, 1 5-in., 2 3-in. A.A., 350 mines; 8 light mine-layers, ex-T.B.D.'s, 1,160-1,190 tons, 35 knots, 4 4-in., 1 3-in. A.A., 80 mines. Terror, 6,000 tons (building), 5-in. guns; Catskill and Ozark (building).

MINEWEEPERS.—26 in number, "Bird" class (1918, 1919), 840 tons, 1,400 H.P., 14 knots, 2 3-in. A.A. guns authorised but not carried. Raven, Osprey, Auk, and 8 others, 600 tons (1941-42); 200 building; 100 converted trawlers.

SEAPLANES.—Albemarle Curtiss (1940); Currutuck, Norton Sound, Pine Island, Puget Sound (Building), 8,300 tons, 18 knots, 2 5-in., 2 3-in., 24 seaplanes; Barney, Biscayne (1941), Casco, Mackinac, Humboldt, Matagorda, Absecon, Chincoteague, Coos Bay, Half Moon, Mobsack, Oyster Bay, Rockaway, San Pablo, Unimak, Yakutat (building), 1,650 tons, 20 knots, 2 5-in.; Langley (1912), 11,050 tons, 15 knots, 4 5-in.; Wright (1921), 8,675 tons, 15 knots, 2 5-in., 2 3-in.; 6 converted Merchant ships, 8,000 tons gross; 14 converted Destroyers; Sandpiper, Ganney, Thrush, Swan, Pelican, Avocat, Teal, Lapwing (1918-1919), 840 tons, 14 knots, 2 3-in.

COAST GUARD CRUISING CUTTERS.—7 in number, 2,000 tons, 20 knots, 2 5-in., 2 6-pr., 1 seaplane; 6 in number, 1,000 tons, 13½ knots, 2 3-in.; 10 in number, 1,500 tons, 16½ knots, 1 5-in., 1 3-in.; 4 in number, 1,800 tons, 15 knots, 2 5-in., 1 3-in.; 9 others, 800-1,200 tons, 12 knots, 2 3-in.

COAST GUARD PATROL BOATS.—19 in number, 311 tons, 16 knots, 1 3-in., 2 6-pr.; 36 in number, 200 tons, 10 knots, 1 3-in.; 15 in number, 45 tons, 22 knots; 58 in number, 37 tons, 13½ knots, 1 1-pr.; 20 motor boats, 20 tons.

MOTOR TORPEDO BOATS.—P1-4, 59 feet long, 40 knots, 2,400 H.P.; P5-8, 81 feet long, 40 knots, 3,600 H.P.; P9 and 22 others, 70 feet long, 43 knots, 3,600 H.P.

SUBMARINE CHASERS.—P.C. 449, 450, 110 feet long, 22 knots, 1 3-in.; P.C. 451, 170 feet long, 22 knots, 1 3-in.; 13 in number (1918-21), 75 tons, 17 knots, 1 3-in.; P.T.C. 1-12 (1941) and P.T.C. 13-36 (building), have wood hulls.

OILERS.—Cimarron, Neosho, Platte (1939), 16,000 tons, 16½ knots, 4 5-in.; Brazos, Neches, Pecos (1920), 5,400 tons, 14 knots, 4 5-in., 2 3-in.; Patoka, Ramapo, Saspelo, Trinity, Sepulga, Salinas, Tippecanoe, Rapidan (1920), 5,375 tons, 10½ knots, 4 5-in.; Maumee, Guyana, Kanawha (1915), 4,990 tons, 14 knots, 4 5-in., 4 4-in.; Laramie, Kaweah, Mattole (1920), 4,410 tons, 11 knots, 2 5-in., 2 3-in.; Robert L. Barnes (1917), 1,630 tons, 8½ knots; Sabine, Salamonde, Kaskaskia, Sangamon, Chemung, Chenango, Guadalupe, Santee, Suwannee.

DESTROYER TENDERS.—Dobbin (8,325 tons); Whitney (8,325 tons), and Melville (5,250 tons), 16 knots, 8 5-in., 4 3-in.; Altair, Denebola and Rigel, 6,250 tons, 10½ knots, 8 5-in., 4 3-in. A.A.; Black Hawk, 5,600 tons, 13 knots, 4 5-in.; Bridgeport, 7,125 tons, 12½ knots, 8 5-in.; Dixie, Prairie, 9,000 tons, 16½ knots; Piedmont, Sierra, Yosemite and Cascade, building.

SUBMARINE TENDERS.—Holland (1926), 8,100 tons, 16 knots, 8 5-in., 4 3-in. A.A., 2 6-pr.; Canopus (1919), 5,975 tons, 13 knots, 2 5-in., 4 3-in. A.A.; Camden (1900), 6,075 tons, 12 knots, 4 4-in., 2 3-pr.; Beaver (1910), 4,670 tons, 16½ knots, 4 5-in., 2 1-pr.; Argonne (1921), 8,400 tons, 15½ knots, 2 6-pr.; Fulton, Sperry (building), 9,000 tons, 16 knots; Griffin, 16½ knots; Seagull (1919), 840 tons, 14 knots, 2 3-in.; Otus, Pelias, Antaeus, ex-Merchant Vessels.

REPAIR SHIPS.—Medusa (1924), 5,125 tons, 16 knots, 4 5-in., 2 3-in. A.A., 2 6-pr.; Vestal, Prometheus (1909), 6,625 tons, 16 knots, 4 5-in., 1 3-in.; Vulcan, 9,500 tons (1941). TRAINING SHIP.—Wyoming (1912), 26,000 tons, 18 knots, 6 12-in., 16 5-in., 8 3-in.; Wheeling, 870 tons, 13 knots, 1 4-in.; Wilmington, 1,280 tons, 15 knots, 8 4-in.

5 Store ships, 25 Cargo ships, 20 Transports, 9 Patrol vessels (Eagle class, 430 tons, 18 knots, 2 4-in., 1 3-in. A.A.), 35 tugs, 10 cable ships, 7 Auxiliaries, 20 Yachts, 48 Net Tenders.

HOSPITAL SHIPS.—Solace (ex-Iroquois), 1927, 6,200 tons gross, 19 knots, 4 5-in., 2 3-pr.; Bowditch (1929), Hannibal, Andradite.

SURVEY VESSELS.—Sumner (1915), 2,900 tons, 14 knots, 4 5-in., 2 3-pr.; Pigeon, Widegon, Chewink (1918-19), 1,060 tons, 14 knots.

SUBMARINE RESCUE VESSELS.—Ortolan, Falcon, Mallard, Pigeon, Widegon, Chewink (1918-19), 1,060 tons, 14 knots.

For Destroyers and Submarines, see Flotilla Tables.

SHIPS OF THE LESSER NAVIES.

BULGARIA.

MOTOR TORPEDO BOATS.—2 in number (Lurssen, 1939), 60 tons, 30 knots, 1 m.a.a., 2 21-in. torpedo tubes.

PATROL VESSELS.—**Derzki**, **Khrabri**, **Letoutschy**, **Shumni**, **Smeli**, and **Strogi** (ex-French, 1907-08), 97 tons, 17 knots, 2 1·85-in., 1 m., 2 18-in. torpedo tubes.

MINESWEEPERS.—2 in number (ex-French, 1918), 350 tons, 17 knots.

TRAINING SHIPS.—**Tsar Assen** (ex-Dutch, 1912), 240 tons, 9 knots, 2 2·6-in., 1 m.; **Kamcia** (1898), 10 knots; **Simeon**, 600 tons, 2 3-in., 4 1·5-in.

MOTOR BOATS.—**Vzrif** and **Capitan Minkoff** (ex-French, 1918), 40 tons, 14 knots, 2 m.; **Belmoretz** and **Chernomoretz** (ex-French, 1918), 77 tons, 17 knots, 1 1·85-in., 2 m.

CHINA.

GUNBOATS.—**Chang Ning**, **Cheng Ning**, **Wu Ning**, **Sui Ning**, **Wei Ning**, and **Su Ning** (Shanghai, 1933-34), 300 tons, 11 knots, 2 2·25-in., 3 m.; **Min Sen** and **Min Chuan** (Shanghai, 1931), 460 tons, 16 knots, 1 4·7-in., 1 4-in., 1 3-in., 2 2·24-in.; **Chu Chien** (Kobe, 1906); **Chu Kuan** and **Chu Tung** (Kobe, 1907), 11 knots, 1 3-in.; **Yung Sui** (Shanghai, 1929), 600 tons, 18 knots, 1 6-in., 1 4·7-in., 3 3-in., 2 2·24-in., 2 1·5-in. a.a., 4 m.

RIVER GUNBOATS.—**Kiang Hsi** and **Kiang Kan** (Germany, 1912), 140 tons, 9 knots.

TORPEDO BOAT.—**Hu Chun** (Kobe, 1908), 96 tons, 20 knots, 1 1·85-in., 1 1·5-in., 3 14-in. torpedo tubes.

ARMED LAUNCHES.—15 in number.

ARMED TRANSPORTS.—25 in number

PATROL VESSELS.—4 in number.

COLOMBIA.

DESTROYERS.—**Caldas** and **Antioquia** (Yarrow, 1934), 1,282 tons, 319 ft. B.P., 31 ft. beam, 36 knots, 4 4·7-in., 3 1·5-in. a.a., 2 depth charge throwers, 8 21-in. torpedo tubes, 236 tons of oil fuel, 140 complement.

GUNBOATS.—**Mariscal Sucre** (Yarrow, 1909), 500 tons, 23 knots, 2 3-in., 3 m.; **Cordoba** (ex-French, 1919), 450 tons, 16 knots, 4 3-in.; **Pichincha**, **Carabobo**, and **Junin** (ex-French, 1925), 200 tons, 13 knots, 1 3-in., 2 m.; **Barranquilla** and **Cartagena** (Yarrow, 1930), 140 tons, 13·5 knots, 2 3-in., 8 m.; **A**, **B**, **C**, **D** (ex-German L.M. 15, 17, 19, 20, 1918), 12 tons, 28 knots, 2 m.; **Nos. 1, 2, 3, 4** (Yarrow, 1913), 20 tons, 12 knots, 1 1-pdr.

RIVER GUNBOAT.—**Presidente Mosquera**, 200 tons.

TRANSPORTS.—**General Mosquera** (Caledon Shipbuilding Co., 1910),

3,500 tons, 2 3·5-in. ; **Bogota** (ex-German, 1919), 500 tons, 16 knots, 1 3·5-in., 2 3-in., 2 m. ; **Boyaca** (ex-U.S.A., 1920), 3,000 tons.

TRAINING SHIP.—**Cucuta** (ex-U.S.A., 1913), 12,000 tons, 10 knots.

CUBA.

LIGHT CRUISER.—**Cuba** (Cramp, Philadelphia, 1911), 2,055 tons, 18 knots, 6,000 H.P., 2 4-in., 6 3-in. H.A., 4 6-pdr., 4 3-pdr., 2 m., 250 tons of coal.

GUNBOATS.—**General Zagaz**, 500 tons, 2 1-pdr. ; **Capitan Fernandez Quevedo** (Havana, 1932), 115 tons, 12 knots, 1 3-in. H.A., 2 1-pdr. ; **Habana**, **Pinar del Rio**, **Villas**, and **Matanzas** (Havana, 1912), 80 tons, 12 knots, 1 1-pdr. ; **24 de Febrero** and **10 de Octubre** (J. S. White, 1911), 218 tons, 12 knots, 3 3-pdr. ; **Baire** (Danzig, 1906), 500 tons, 14 knots, 4 3-in., 2 3-pdr., 1 m. ; **Yara** (Middlesbrough, 1905), 450 tons, 12 knots, 1 3-in. H.A., 2 6-pdr. ; **20 de Mayo** (Glasgow, 1895), 200 tons, 12 knots, 2 3-pdr., 1 1-pdr. ; **Enrique Villuendus** (ex-U.S.A., 1899), 178 tons, 16 knots, 2 3-pdr.

TRAINING SHIP.—**Patria** (Cramp, Philadelphia, 1911), 1,200 tons, 16 knots, 2 3-in., 4 6-pdr., 4 3-pdr.

DOMINICA.

ARMED TRANSPORT.—**Presidente Trusillo** (Germany, 1910), 1,300 tons, 11 knots.

COAST GUARD CUTTERS.—3 in number (ex-U.S.A. C.G. 110, 144, 302) (1924), 37 tons, 13·5 knots, 1 1-in.

YACHT.—**Ramsis** (ex-Camargo, 1928), 969 tons gross, 2 3-pdr.

ECUADOR.

PATROL VESSEL.—**Tarqui**, 50 tons, 1 torpedo tube.

TRAINING SHIP.—**President Alfaro** (Southampton, 1917), 1,030 tons, 16 knots, 2 3-in.

GUNBOAT.—**Abdon Calderon** (ex-Cotopaxi) (1884), 700 tons, 10·5 knots.

TRANSPORT.—**Patria**.

DESPATCH BOAT.—**Atahualpa**.

EGYPT.

PATROL VESSELS.—**Raqib** (Alexandria, 1938), 15 knots, 1 1·46-in. ; **Al Sarea** (J. S. White, 1937), 13 tons, 36 knots, 1 1·46-in. ; **El Amira Fawzia** (Swan Hunter, 1929), 2,640 tons, 14 knots, 2 3-pdr. ; **El Amir Farouq** (Hawthorn Leslie, 1926), 1,441 tons, 17 knots, 1 6-pdr., 2 m. ; **Mabahiss** (Swan Hunter, 1930), 618 tons, 11 knots, 1 3-pdr.

TRAINING SHIP.—**Abdel Monaym** (Clydebank, 1902), 610 tons, 13·5 knots.

INSPECTION VESSEL AND STORE CARRIER.—**Naphtys** (Kiel, 1905), 650 tons, 7·5 knots.

TRANSPORT.—**Sollum** (ex-Syringa, Workman Clark, 1917), 1,290 tons, 16 knots, 1 3-pdr.

ROYAL YACHT.—**Mahroussa** (Poplar, 1865), 4,561 tons, 16 knots.

COASTAL MOTOR BOATS.—**Darfeel** and **Noor El Bahr** (Thornycroft, 1926), 20 tons, 17 knots, 1 1·46-in. ; **Qamar**, 23 tons, 11 knots ; **El Hoot**, 24 tons, 7 knots.

ESTONIA.

TORPEDO BOAT.—**Sulev** (ex-German, 1917), 200 tons, 26 knots, 2 8-in., 2 18-in torpedo tubes, 10 mines.

SUBMARINES.—**Lembit** and **Kalev** (Vickers, 1937), 620/820 tons, 13½/8½ knots, 1 1·57-in., 4 21-in. torpedo tubes, 20 mines.

MINELAYERS.—**Suuroop** and **Ristna** (1906), 500 tons, 12 knots, 1 8-in., 1 1-pdr.

ICEBREAKERS.—**Suur Toll** (Stettin, 1914), 4,000 tons, 15 knots ; **Tasua** (1914), 1,100 tons ; **Jaak Poska** (1929), 250 tons, 11 knots.

PEIPUS LAKE GUNBOATS.—**Ahti** (1908), 144 tons, 10 knots, 2 1·5-in., 2 1-pdr. ; **Tartu**, 108 tons, 12 knots, 2 1·5-in., 2 m.

GUNBOAT.—**Laine** (1915), 450 tons, 12 knots, 2 8-in.

RIVER GUNBOAT.—**Mardus** (1911), 100 tons, 10 knots, 2 8-in., 2 m.

MINESWEEPERS.—**Keri** (ex-Kalev) and **Vaindlo** (ex-Olev) (1914), 50 tons, 9 knots, 1 8-pdr. ; **Tahkona** (1919), 45 tons, 12 knots.

TUG.—**Tallin** (1900), 100 tons, 10 knots.

TENDERS.—**Kompass** (1919), 300 tons, 9 knots ; **Sakala** (1906), 30 tons, 8 knots.

FINLAND.

ARMOURED VESSELS.—**Väinämöinen** and **Ilmarinen** (Crichton-Vulcan, 1932), 300 ft. length, 54 ft. beam, 3,900 tons, 15 knots, 4 10-in., 8 4·1-in. A.A., 4 m., 2-in. armour belt.

MOTOR TORPEDO BOATS.—**Sisu** and **Hurja** (ex-Italian, 1920), 13 tons, 25 knots, 2 m., 2 18-in. torpedo tubes ; **Isku** (1925), 54 ft. length, 11 tons, 25 knots ; **Syöksy**, **Nuai**, **Vinha**, and **Raju** (1929), 13 tons, 35 knots, 2 m., 2 18-in. torpedo tubes. 5 ordered in U.S.A., March, 1940.

SUBMARINES.—**Iku-Turso**, **Vetehinen** and **Vesihisi** (Abo, 1930), 490/710 tons, 14·5/8·5 knots, 1 8-in., 4 21-in. torpedo tubes, 20 mines ; **Vesikko** (Crichton Vulkan, Abo, 1933), 250/300 tons, 12/7 knots, 1 m., 3 21-in. torpedo tubes ; **Saukko** (Helsingfors, 1930), 100/136 tons, 8/5·5 knots, 1 m., 2 18-in. torpedo tubes, 6 mines.

GUNBOATS.—**Turunmaa** (ex-Russian Orlan, 1918), 342 tons, 14 knots, 2 8-in., 5 6-pdr. ; **Uusimaa** (ex-German Beo) and **Hämeenmaa** (ex-German Wulf, 1918), 400 tons, 15 knots, 2 4-in., 1 1·5-in. A.A. ; **Vakava** and **Aallokas** (1935).

MINELAYERS.—**Pommi**, **Paukku**, **Lieska**, **Miina**, **Loimu** (1916), 80 tons, 8 knots, 2 m., 24 mines ; **Vakava** and **Klercker** (building), 300 tons.

MINESWEEPERS.—**Bautu** (ex-Russian Murman, 1917) and **Vilppula** (1916), 165 tons, 12 knots, 2 8-in., 1 1·5-in. A.A. ; **Ahven**, **Kiiski**, **Muikku**, and **Sarki** (1937), 17 tons. 10 knots.

SALVAGE VESSEL.—**Mursu** (ex-Stannum) (1902), 615 tons gross, 8 knots.

- SUBMARINE DEPOT SHIP.**—*Louhi* (ex-Russian *Voin*, 1917), 640 tons, 11 knots, 2 1·85-in., 150 mines.
- MOTOR LAUNCHES.**—*Haukka*, **A.37**, **A.38**, **A.40**, **A.42**, **A.43**, **A.45**, **A.F.2**, **B.3**, **B.V.A.** and **B.V.D.** (1934), 9–25 tons, 8–10 knots, 1 m.
- PATROL BOATS.**—**V.M.V. 1, 2, 5, 6** (1931), **V.M.V. 8–17** (Germany, 1935), 30 tons, 25 knots, 1·75-in.
- TRAINING SHIP.**—*Suomen Joutsen* (St. Nazaire, 1902), 3,000 tons, 6 knots.
- ICEBREAKERS.**—*Sisu* (Helsingfors, 1939), 2,000 tons, 15 knots, 2 4-in. ; *Otso* (1936), 800 tons, 13 knots ; *Jääkarhu* (1926), 4,825 tons, 15 knots ; *Sampo* (Armstrong, 1899), 1,850 tons, 15 knots, 3 4·7-in. ; *Tarmo* (ex-*Sampo II*) (Armstrong, 1907), 2,400 tons, 14 knots ; 3 4·7-in. ; *Murtaja* (Stockholm, 1890), 820 tons, 11 knots, 1 4·7-in. ; *Apu* (Kiel, 1899), 600 tons, 13 knots, 2 4·7-in. ; *Voina* (Sandvikens, 1924), 2,000 tons, 14 knots, 1 4·7-in.

HAYTI.

- SPECIAL SERVICE VESSELS.**—*Nord Alexis* (1891), 1,230 tons, 14 knots, 2 4·7-in. ; *Veretieres* (1889), 270 tons, 9 knots, 2 m. ; 17 *Décembre* 851 tons ; *Pacifique*, 488 tons, 14 knots.

HUNGARY.

- PATROL VESSELS.**—*Debreczen*, *Gyor*, *Baja*, and *Sopron* (Budapest, 1918), 140 tons, 15 knots, 2 2·75-in., 2 m. ; *Kecskemet* and *Szeged* (Budapest, 1915), 133 tons, 15 knots, 4 2·75-in., 2 m.
- AUXILIARY VESSELS.**—*Csobánc* (1926), 300 tons, 8 knots ; *Körös* (1916), 170 tons ; *Maros* (1927), 40 tons ; *Mecsek*, 35 tons.
- MOTOR BOATS.**—*Honved*, *Huszar*, and *Tuzer* (1916), 17 tons, 7 knots, 2 m. ; 2 in number, 30 tons ; 10 in number, 10 tons.
- TRAINING SHIP.**—*Badacsony* (1909), 230 tons, 10·5 knots.

ICELAND.

- FISHERY PROTECTION VESSELS.**—*Aegir* (1925), 500 tons, 14 knots, 1 2·24-in. ; *Thor* (ex-German, 1922), 300 tons, 10 knots, 1 2·24-in. ; *Odinn* (1938), 72 tons, 11 knots, 1 1·85-in.

IRAQ.

- PATROL VESSELS.**—**Nos. 1, 2, 3, 4** (Thornycroft, 1937), 100 ft. length, 64 tons, 12 knots, 1 3·7-in. howitzer, 4 m.
- YACHT.**—*Sans Peur* (J. Brown, 1923), 1,200 tons, 13 knots.

LATVIA.

- SUBMARINES.**—*Bonis* and *Spidola* (Nantes, 1927), 390/514 tons, 14·5/9·2 knots, 1 3-in. A.A., 2 m., 6 18-in. torpedo tubes.
- SUBMARINE DEPOT SHIP.**—*Varonis* (1908), 250 tons, 10 knots.
- GUNBOAT.**—*Virsaitis* (ex-German, 1917), 380 tons, 16 knots, 2 3-in., 2 6-pdr., 1 3-in. H.A., 1 torpedo tube.
- MINESWEEPERS.**—*Imanta*, *Viesturs* (1926), 215 tons, 14 knots, 1 3-in. 4 m.

ICEBREAKER.—**Krisjanis Valdemars** (Beardmore, 1925), 2,800 tons, 14 knots.

SURVEYING VESSEL.—**Hidrografs** (Danzig, 1918), 450 tons, 10 knots.

LITHUANIA.

PATROL VESSEL.—**Prezidentas Smetone** (ex-German, 1917), 500 tons, 17 knots, 2 3-in., 3 m.

MANCHUKUO.

DESTROYER.—**Hai Wei** (ex-Japanese Kashi, Maizura, 1917), 755 tons, 31·5 knots, 3 4·7-in., 3 m., 6 18-in. torpedo tubes.

GUNBOATS.—**Chingjen** and **Tingpien** (Harima, 1935), 290 tons, 13 knots, 2 4·7-in., 3 m.; **Shun T'ien** and **Yank Min** (Harima, 1934), 270 tons, 12 knots, 2 4·7-in. A.A., 3 m.; **Li Sui** (ex-German, 1910), 270 tons, 13 knots, 2 2·24-in., 2 m.; **Li Chi** (ex-German, 1904), 270 tons, 13 knots, 1 3-in., 4 m.; **Kuang Ning**, **Kuang Ch'ing**, and **Chiang T'ung** (1900), 200 tons, 9 knots, 1 3-in., 4 m.; **Ta T'ung** and **Li Min** (Kobe, 1933), 65 tons, 10·5 knots, 3 m.

ARMED LAUNCHES.—**Chi Min** (Kawasaki, 1934), 20 tons, 10 knots, 2 m.; **En Min**, **Hui Min**, **P'u Min** (Kawasaki, 1933), 15 tons, 10 knots, 2 m.

PATROL BOATS.—**Hailung** and **Haifeng** (Kawasaki, 1933), 184 tons, 14 knots, 2 3·1-in., 2 m.; **Hai Kuang**, **Hai Jui**, **Hai Jung**, **Hai Hua** (Kawasaki, 1933), 42 tons, 12 knots, 1 2·24-in., 2 m.; **Daichi Kaihen** and **Daini Kaihen** (Yokohama, 1933), 42 tons, 15 knots, 2 m.

MEXICO.

COAST DEFENCE VESSEL.—**Anahuac** (ex-Brazilian Deodoro, La Seyne 1898), 3,162 tons, 15 knots, 2 9·4-in., 4 4·7-in., 4 6-pdr., 2 1-pdr., 14-in. armour belt.

SLOOPs.—**Durango** (Valencia, 1936), 1,600 tons, 20 knots, 4 4-in., 2 twin 1-in. pom poms, 2 quadruple ·5-in. m., can carry 500 men and 80 horses; **Protosi** (Cadiz, 1935), **Queretaro** and **Guanajuato** (Ferrol, 1935), 1,200 tons, 20 knots, 3 4-in., 2 twin 1-in. pom poms, 2 quadruple ·5-in. m. A.A., can carry 250 men and 20 horses.

GUNBOATS.—**Nicolas Bravo** (Odero, 1904), 1,227 tons, 12·3 knots, 2 4-in., 4 6-pdr., 2 m.; **G. Nos. 20-29** (Bilbao, 1935), 130 tons, 26 knots, 1 twin ·5 pom pom, 1 quadruple 1-in. pom. pom.

TRANSPORTS.—**Progreso** (Genoa, 1907), 1,590 tons, 13 knots, 4 6-pdr., 2 m.; **Bolivar** (1920), **Washington** (1920), **Moctezuma** (1919), **Coahuila** and **Jalisco** (Philadelphia, 1916), 5,794 tons, 10·5 knots.

OIL TANKER.—**Mexico** (1913).

PATROL BOATS.—**Mazatlan**, **Acapulco**, and **Vera Cruz** (Canada, 1918), 486 tons, 8 knots, 1 2·2-in., 2 1·5-in., 2 m.

NICARAGUA.

GUNBOAT.—**Momotombo**, 400 tons, 2 3-in., 1 6-pdr.

PATROL BOAT.—1 in number (ex-U.S.A., CG274) (1924), 37 tons, 75 ft., 13·5 knots, 1 1-pdr.

PARAGUAY.

GUNBOATS.—**Paraguay** and **Humaita** (Genoa, 1931), 636 tons, 17 knots, 4 4·7-in., 4 3-in. H.A., 2 m.; **Capitan Cabral** (Haarlem,

1907), 120 tons, 10 knots, 1 3-in., 2 6-pdr., 2 m.; **Taguari** (Hosking, 1910), 150 tons, 10 knots, 4 3-in., 2 1·46-in.
DESPATCH VESSEL.—**Teniente Herreros** (Conrad, 1908), 100 tons, 12 knots, 1 3-in., 2 1-pdr., 2 m.

PERSIA (IRAN).

GUNBOATS.—**Babr and Palang** (Palermo, 1932), 950 tons, 17 knots, 2 4-in., 2 3-in. H.A., 2 m.; **Shahin** (Vienna, 1917), 150 tons, 3 1-pdr.; **Homay** (Ancona, 1935), 700 tons.
PATROL VESSELS.—**Karkas, Simorgh, Chahbaaz, and Chahrokh** (Naples, 1932), 325 tons, 15 knots, 2 3-in., 2 m.
MOTOR BOATS.—**Azerbaijan, Gehlani, and Mazenderan** (Palermo, 1935), 68½ ft., 28 tons, 14 knots, 1 1·5-in.
TUG.—**Niru** (1935), 14 knots.

PERU.

LIGHT CRUISERS.—**Almirante Grau and Coronel Bolognesi** (Vickers, 1907), 3,200 tons, 24 knots, 2 6-in., 8 3-in., 8 m., 2 18-in. torpedo tubes.
DESTROYERS.—**Almirante Guise** (ex-Russian, 1917), 1,400 tons, 35 knots, 5 4-in., 1 2-pdr. A.A., 1 m., 3 18-in. torpedo tubes; 80 mines; **Almirante Villar** (ex-Russian, 1918), 1,185 tons, 35 knots, 4 4-in., 1 2-pdr., 2 m., 3 18-in. torpedo tubes, 80 mines.
SUBMARINES.—**B.1-4** (U.S.A., 1926-28), 576/682 tons, 14·5/10 knots, 1 3-in. 4 21-in. torpedo tubes.
GUNBOATS.—**Amazonas and Loreto** (Electric S.B. Co., 1934), 250 tons, 15 knots, 4 3-in. H.A., 2 ·8-in., 2 m.; **America** (1904), 350 tons, 14 knots, 2 3-pdr.; **Coronel Portillo** (ex-San Pablo, 1902), 49 tons, 7 knots, 2 3-pdr.; **Iquitos** (1875), rebuilt, 1896, 50 tons, 7·5 knots, 4 1·46-in., 2 ·8-in., 2 m.; **Napo** (Yarrow, 1921), 98 tons, 12 knots, 3 1·8-in.
TRANSPORT.—**Rimac** (ex-Eten, 1907), 6,848 tons gross, 12 knots, cargo capacity, 7,000 tons.
OILER.—**Parinas** (Thornycroft, 1921), 2,820 tons, 10 knots, carries 4,800 tons of oil.

PHILIPPINES.

MOTOR TORPEDO BOATS.—4 in number (Thornycroft, 1939), 40 knots, 4 Lewis guns, 2 torpedo troughs.

POLAND.

DESTROYERS.—**Blyskawica** (J. S. White, 1937), 2,144 tons, 39 knots, 7 4·7-in., 4 1·57-in., 2 triple 21-in. torpedo tubes; **Burza** (Chantiers Navals, 1932), 1,540 tons, 35 knots, 4 5·1-in., 1 2·9-in. H.A., 6 21·7-in. torpedo tubes; **Piorun** (1940), **Krakowiak, Kujawiak**, British built; **Garland**, ex-British, Greyhound class.
SUBMARINES.—**Sep** (Rotterdam, 1939), 1,090/1,450 tons, 14·5/11 knots 1 4·1-in., 2 1·57-in. A.A., 12 21·7-in. torpedo tubes; **Zbik, Rys, and Wilk** (built in France, 1931-32), 965/1,230 tons, 14/9 knots, 1 3·9-in., 1 2-pdr. A.A., 6 21·7-in. torpedo tubes, 40 mines; **Sokol** (1941), British Ursula Class; **Jastrzab** (Bethlehem), 837/1126 tons, 14·5/11 knots, 1 4 in., 4 21-in. torpedo tubes.

NOTE.—**Sep, Zbik, and Rys** are interned in Sweden.

- RIVER MONITORS.**—**Niedoscigniona** and **Niewzyciezona** (Krakow, 1934), **Wilno** and **Krakow** (Krakow, 1926), 70 tons, 9 knots, 1 3-9-in., 2 3-in. A.A., 3 m.; **Warszawa**, **Horodyszczce**, **Pinsk**, and **Torun** (Danzig, 1920), 110 tons, 9 knots, 2 3-9-in., 3 3-in. A.A., 5 m.
- MINELAYER.**—**Gryf** (Havre, 1938), 2,100 tons, 20 knots, 6 4-7-in., 4 1-57-in. A.A., 300 mines.
- MINESWEEPERS.**—**Czapla** and **Zuraw** (Gdynia, 1939), 200 tons, 17 knots; **Czajka** (Modlin, 1936), **Rybitwa** (Modlin, 1935), **Jaskolka** and **Mewa** (Gdynia, 1935), 140 tons, 15 knots, 1 3-in., 4 m.
- SURVEYING SHIP.**—**Pomorzanin** (ex-German, 1917), 200 tons, 14 knots.

PORTUGAL.

- DESTROYERS.**—**Douro**, **Tejo**, **Dao** (Yarrow, Lisbon, 1935-36), **Lima** and **Vega** (Yarrow, Glasgow, 1933), 1,220 tons, 33,000 S.H.P., 36 knots, 4 4-7-in., 3 1-5-in. A.A. pom poms, 2 quadruple 21-in. torpedo tubes, 20 mines, complement 164; **Tamega** (Lisbon, 1924), 520 tons, 11,000 S.H.P., 27 knots, 1 4-in., 2 3-in., 4 18-in. torpedo tubes, complement 80. Three Destroyers building.
- MOTOR TORPEDO BOATS.**—6 in number, building.
- SUBMARINES.**—**Golfinho**, **Espadarte**, **Delfim** (Vickers, 1934-35), 900/1,100 tons, 2,300/1,000 B.H.P., 16-5/9-2 knots, 1 4-in., 2 m., 6 21-in. torpedo tubes. Three submarines building.
- GUNBOATS.**—**Faro** and **Lagos** (Lisbon, 1928, 1932), 300 tons, 13 knots, 2 1-85-in.; **Beira** (1910), **Ibo** (1912), **Mandovi** (1918), **Zaire** (1297), **Diu** (1932), built at Naval Arsenal, Lisbon, 400 tons, 13 knots, 2 3-in., 2 3-pdr., 2 m.; **Limpopo** (Blackwall, 1890), 200 tons, 11 knots, 2 3-pdr.
- RIVER GUNBOATS.**—**Macau** (Yarrow, 1909), 95 tons, 12 knots, 2 6-pdr., 3 m.; **Rio Minho** (Lisbon, 1904), 37 tons, 7-5 knots, 1 1-pdr., 2 m.; **Tete** (Yarrow, 1904), 70 tons, 7-5 knots, 2 3-pdr., 3 1-pdr.
- SLOOPs.**—**Bartolomeu Dias** and **Afonso de Albuquerque** (Hawthorn Leslie, 1935), 1,780 tons, 21 knots, 4 4-7-in., 2 3-in. H.A., 4 pom poms, 2 depth charge throwers, 40 mines; **Joao de Lisboa** (ex-Infante don Henrique, 1937) and **Pedro Nunes** (1935), built at Lisbon, 1,080 tons, 17 knots, 2 1-85-in., 4 1-57-in. A.A., 2 depth charge throwers; **Goncalves Zarco** and **Goncalo Velho** (Hawthorn Leslie, 1933), 950 tons, 16-5 knots, 3 4-7-in., 2 1-85-in., 2 2-pdr. pom poms.; **Republica** (ex-H.M.S. *Gladiolus*, Scotstoun, 1915), 950 tons, 17 knots, 2 4-in., 2 3-in. H.A., 4 3-pdr., 2 m.
- TRAINING SHIPS.**—**Vulcano** (Thornycroft, 1910), 500 tons, 12 knots; **Lince** (Leghorn, 1911), 77 tons, 12 knots; **Sagres** (Bremerhaven, 1896), 3,100 tons, 7 knots.
- FISHERY PROTECTION VESSELS.**—**Lidador** (Birkenhead, 1884), 200 tons, 9 knots, 2 3-pdr.; 2 in number, building, 250 tons, 18 knots, 4 1-in. A.A.
- HOSPITAL SHIP.**—**Gil Eanes** (Bremerhaven, 1914), 2,700 tons, 10-5 knots.
- SURVEYING SHIPS.**—**D. Joad de Castro** (Alfeite, 1941), 960 tons, 14 knots, 1 3-in., 1 aircraft; **Berrio** (La Loire, 1898), 350 tons, 10 knots; **Carvalho Araujo** (ex-H.M.S. *Jonquil*, 1915), 900 tons, 17 knots.
- LIGHTHOUSE TENDER.**—**Almirante Schultz** (Penhoy, 1929), 520 tons, 11-5 knots.

TANKER.—1 in number, building at **Alfeite**, 7,000 tons (capacity 3,500 tons), 12 knots, 1 3-9-in. A.A.

ROUMANIA.

DESTROYERS.—**Regele Ferdinand** and **Regina Maria** (Naples, 1930), 1,785 tons, length 348½ ft., 42,000 S.H.P., 38 knots, 5 4-7-in., 1 3-in. H.A., 2 triple 21-in. torpedo tubes, 50 mines; **Marasti** (ex-Italian Sparviero, 1917) and **Marasesti** (ex-Italian Nibbio, 1918), 1,460 tons, 40,000 S.H.P., 35 knots, 5 4-7-in. 4 3-in. H.A., 2 m., 2 double 18-in. torpedo tubes, 50 mines.

MOTOR TORPEDO BOATS.—3 in number (ex-British, 1939), 70 ft. length, 30 tons, 41 knots, 8 m., 2 21-in. torpedo tubes.

TORPEDO BOATS.—**Naluca**, **Sborul**, and **Zmeul** (ex-Austrian, 1913-14), 260 tons, 28 knots, 2 2-6-in., 2 torpedo tubes in **Naluca** and **Sborul**.

SUBMARINES.—**Delfinul** (Fiume, 1936), 700/950 tons, 1,600/1,300 S.H.P., 14/9-5 knots, 1 4-2-in., 6 21-in. torpedo tubes; **S.1**, **S.2** (Galatz, 1941).

SUBMARINE DEPOT SHIP.—**Constanta** (Fiume, 1930), 1,821 tons, 13 knots, 2 4-in.

RIVER MONITORS.—**Lascar Catargiu**, **Ioan Bratianu**, **Mihail Kogalniceanu**, **Alexandru Lahovari** (Trieste, 1907-08), 680 tons, 13 knots, 3 4-7-in., 1 3-in. A.A., 2 1-85-in., 4 m.; **Bucovina** (ex-Austrian Sava, Budapest, 1916), 550 tons, 12 knots, 2 4-7-in., 2 4-7-in. howitzers, 2 2-6-in. A.A., 2 1-85-in. 6 m.; **Basarabia** (ex-Austrian Inn, Budapest, 1915), 590 tons, 12 knots, 2 4-7-in., 2 4-7-in. howitzers, 2 1-85-in., 9 m.; **Ardeal** (ex-Austrian Temes, Budapest, 1904), 450 tons, 10 knots, 2 4-7-in., 1 3-5-in. A.A., 2 1-85-in., 2 m.

GUNBOATS.—**Stihi** (ex-French Friponne, Lorient, 1917), **Dumitrescu** (ex-French Mignonne, Brest, 1917), **Ghiculescu** (ex-French Impatiente, Brest, 1916), 350 tons, 15 knots, 2 3-9-in., 2 m.

PATROL BOATS.—**Nos. 1-7** (Thornycroft, 1908), 100 ft., 50 tons, 18 knots, 1 3-pdr., 1 m.

RIVER GUNBOATS.—**Bistritsa**, **Oltul**, and **Siretul** (Blackwall, 1888), 100 tons, 12 knots, 1 6-pdr., 1 1-pdr.

MINELAYERS.—**Admiral Murgescu** (Galatz, 1940), and **Cetetea Alba** (Hamburg, 1940), 812 tons, 16 knots, 2 4-in., 2 1-46-in., 135 mines.

YACHTS.—**Luceafarul** (Glasgow, 1931), 1,580 tons, 17 knots; **Taifun** (J. S. White, 1938), 34 tons.

TRAINING SHIP.—**Mircea** (Hamburg, 1939), 1,750 tons, 10 knots.

MOTOR BOATS.—10 in number (some armoured), 40 tons, 14 knots.

ARMED MOTOR LAUNCHES.—7 in number, 30-50 tons.

THAILAND.

CRUISERS.—2 in number, building at Trieste, 4,200 tons, 45,000 S.H.P., 30 knots, 6 5-9-in., 6 3-in. A.A., 2 triple 18-in. torpedo tubes.

DESTROYER.—**Phra Ruang** (ex-British Radiant, Thornycroft, 1917), 718 tons, 29,000 S.H.P., 35 knots, 3 4-in., 1 2-pdr. pom pom., 1 m., 2 double 21-in. torpedo tubes.

TORPEDO BOATS.—**Jumbara**, **Pattani**, **Surasdra**, **Chandaraburi**, and

Rayong (Monfalcone, 1937), 470 tons, 10,000 S.H.P., 31 knots, 3 8-in. A.A., 4 8-in. m., 6 18-in. torpedo tubes; **Puket and Trad** (Tireste, 1936), 380 tons, 9,000 S.H.P., 31 knots, 3 8-in. A.A., 4 8-in. m., 6 18-in. torpedo tubes. Three in number building at Trieste.

MOTOR TORPEDO BOATS.—6 in number (Thornycroft, 1930–35), 55 ft., 13·5 tons.

SUBMARINES.—**Blai Jumbol, Sinsamudr, Machanu, Virun** (Mitsubishi, 1938), 325 tons, 14·5/8 knots, 1 m., 5 21-in. torpedo tubes, complement 24. Four others projected.

GUNBOATS.—**Sri Ayudhya** (Mitsubishi, 1938), 2,000 tons, 15·5 knots, 4 8-in., 4 3-in.; **Sukhodaya** (Vickers, 1930), 890 tons, 13 knots, 2 6-in., 4 3-in. A.A., 2½-in. armour belt; **Mongkut Rajakumarn** (ex-Filipinas, Hong Kong and Whampoa Doca Co., 1887), 700 tons, 11 knots, 2 4·7-in., 2 6-pdr., 3 3-pdr.; **Sugbrib** (1901), 410 tons, 11·5 knots, 1 4·7-in., 5 6-pdr., 2 m.; **Suriya Monthon** (Thornycroft, 1908), 190 tons, 14·5 knots, 1 6-pdr., 4 m.; **Ratnakosindr** (Armstrong, 1925), 890 tons, 12 knots, 2 6-in., 4 3-in. H.A., 2½-in. armour belt.

MINELAYERS.—**Bang Rachan (S1)** and **Nong Sarai (S2)** (Monfalcone, 1936), 368 tons, 12 knots, 2 3-in., 140 mines. A third vessel is building at Ancona.

PATROL BOATS.—**Klongyai, Takbai, and Kantang** (Yokohama, 1937), 110 tons, 18 knots, 1 3-in., 3 8-in. m., 2 18-in. torpedo tubes. Twelve in number building, 100 tons.

TRAINING SHIPS.—**Tachin and Maeklong** (Uraga, 1937), 1,400 tons, 17 knots, 4 4·7-in., 2 5-in. m. A.A., 2 double 12-in. torpedo tubes, 20 mines; **Chao Phra** (ex-British Havant, 1918), 700 tons, 16 knots. Two others projected.

SURVEY SHIPS.—**Cuong, Han Thale, Liev Thale, and Chen Thale**, 400 tons, 8 knots.

FISHERY PROTECTION VESSELS.—**Sara Sindhu, Thiew Uthok, Travane Vari** (Bangkok, 1936), 50 tons, 9·5 knots, 1 1·5-in. Three others buiding.

TUG.—**Samet** (ex-Pi-Sua-Nam), 90 tons, 9·5 knots.

TRANSPORTS.—**Angthong** (ex-Maha Chakkri, Kawasaki, 1918), 2,700 tons, 15 knots, 4 3-in.; **Chang** (ex-Vides Kichkar, Maryport, 1902), 750 tons, 9·5 knots; **Pagan and Sichau** (Harima, 1938), 650 tons.

OIL TANKER.—**Samui** (Hakodate, 1936), 1,800 tons, 12 knots. One other projected.

TURKEY.

BATTLE CRUISER.—**Yavouz Sultan Selim** (ex-Goeben, Hamburg, 1912), 22,734 tons, 52,000 S.H.P., 27 knots, 10 11-in., 10 5·9-in., 8 3·5-in., A.A., 14 1·5-in. m.p.p., 4 m., 4 19·7-in. torpedo tubes, complement 1,000.

CRUISERS.—**Hamidieh** (Armstrong, 1904), 3,790 tons, 12,000 H.P., 22 knots, 2 5·9-in., 6 3-in., 8 3-in. H.A., 2 18-in., torpedo tubes, 70 mines; **Medjidieh** (ex-Russian Prutt, Cramp, 1904), 3,300 tons, 12,000 H.P., 22 knots, 4 5·1-in., 2 3-in. H.A., 4 m. Two in number projected, 8,000 tons.

DESTROYERS.—**Kocatepe and Adatepe** (Ansaldo, 1932), 1,300 tons,

38,000 S.H.P., 38 knots, 4 4·7-in., 3 2-pdr. H.A., 3 m., 6 21-in. torpedo tubes, 40 mines; **Tinaztepe** and **Zafer** (Riva Trigoso, 1932), 1,840 tons, 50,000 S.H.P., 38 knots, 4 4·7-in., 3 2-pdr. A.A., 2 triple 21-in. torpedo tubes; **Sultan Hisar** and **Dimir Hisar** (Denny Bros., 1941), **Muavenet** and **Gayret** (Vickers, 1941), 1,370 tons, 34,000 S.H.P., 35 knots, 4 4·7-in., 6 1·5-in. A.A., 2 quadruple 21-in. torpedo tubes.

TORPEDO BOATS.—**Berk** (ex-Berkisatvet) and **Peyk** (ex-Peikishevket, Kiel, 1907), 830 tons, 20 knots, 2 6-in., 4 6-pdr., 2 1-pdr., 2 m., 3 18-in. torpedo tubes, 30 mines.

MOTOR TORPEDO BOATS.—**Doghan**, **Marti**, and **Deniz Kouchou** (Venice, 1932), 31 tons, 34 knots, 1 3-in., 1 1-in. pom pom., 2 18-in. torpedo tubes, 6 depth charge throwers Six in number building.

SUBMARINES.—**Burak Reis**, **Murat Reis**, **Uluc Ali Reis**, **Oruc Reis** (Vickers, 1941), 624/856 tons, 1,200/708 H.P., 13·7/8·4 knots, 1 4-in., 3 m., 5 21-in. torpedo tubes; **Atilay**, **Yildiray** (Istanbul, 1941), **Saldiray** (Kiel, 1939), 820/1,100 tons, 4,800 H.P., 20/9 knots, 1 4-in., 6 21-in. torpedo tubes, 40 mines; **Dumlupinar** (Monfalcone, 1932), 935/1,220 tons, 2,400/1,400 H.P., 15/9·5 knots, 1 4-in. H.A., 3 m., 4 21-in. torpedo tubes, 40 mines; **Gur** (Cadiz, 1931), 750/260 tons, 2,800/1,000 H.P., 20/9 knots, 1 6-in., 1·8-in. m., 6 21-in. torpedo tubes; **İnönü I** and **İnönü II** (Rotterdam, 1928), 433/556 tons, 1,100 H.P., 13·5/8·5 knots, 1 3-in. H.A., 1 m., 6 17·7-in. torpedo tubes.

SUBMARINE DEPOT SHIPS.—**Erkin** (ex-S.S. Trier, Bremen, 1923), 16,000 tons, 12·5 knots, 2 m.; **Akin** (ex-Rasit, Smith's Dom Co., 1913), 33 tons, 12 knots; **Marmora** (ex-R.S. Syria, 1906), 1,500 tons.

MINESWEEPERS.—**Hizar Reis**, **İsa Reis**, and **Kismal Reis** (La Seyne, 1912), 443 tons, 14 knots, 3 3-in., 2 3-pdr., 2 m. Twenty others.

MINELAYERS.—**Sivri Hisae** and **Yuzbashi Hakki** (Thornycroft, 1940), 350 tons, 15 knots, 1 3-in., 80 mines; **Atak** and **Dalgital** (İsmidt, 1940, 1941), 500 tons, 13 knots, 40 mines; **Nusret** (ex-Yardim, Kiel, 1913), 360 tons, 15 knots, 2 m., 25 mines; **Uyanik** (ex-İntibah, Port Glasgow, 1886), 600 tons, 12 knots, 50 mines. Sixteen others.

OIL TANKER.—**Gölcük** (İsmidt, 1937), 1,400 tons, 10 knots, 750 tons capacity.

YACHTS.—**Gunes Dil** (ex-Savarona, Hamburg, 1931), 5,700 tons, 21 knots, 2 3-pdr.; **Ertougrul** (Armstrong, 1903), 900 tons, 21 knots, 8 3-pdr.

GUNBOAT.—**Aidin Reis** (St. Nazaire, 1913), 502 tons, 14 knots, 2 4-in., 2 6-pdr., 4 m.

URUGUAY.

TORPEDO GUNBOAT.—**Uruguay** (Stettin, 1910), 1,150 tons, 23 knots, 2 4·7-in., 4 3-in., 6 1-pdr., 4 m., 2 18-in. torpedo tubes.

PATROL BOATS.—**Paysandu**, **Salto**, and **Rio Negro** (Ancona, 1935), 150 tons, 16 knots, 2 3-in., 2 m.

SURVEYING SHIPS.—**18 De Julio** (Leith, 1879), 680 tons, 12 knots, 2 m.; **Capitan Miranda** (Cadiz, 1930), 516 tons, 12 knots.

TUGS.—**Zapican** (ex-Atlantico, 1911), 162 tons, 10 knots; **Van-**

guardia (Glasgow, 1908), 95 tons, 12 knots, 2 1·5-in. ; **Corsario** (1888), 180 tons, 10 knots, 3 1·5-in. ; **Huracán** (ex-Fortuna, 1879), 197 tons, 12 knots.

TRAINING SHIP.—**Aspirante** (ex-Exir Dellen, 1919), 250 tons, auxiliary motor.

VENEZUELA.

MINELAYERS.—**General Soublotte** (ex-Italian Dardanelli) and **General Urdaneta** (ex-Italian Milazzo) (Monfalcone, 1926), 615 tons, 15 knots, 2 4-in., 1 3-in. H.A., 80 mines.

GUNBOATS.—**Mariscal Sucre** (ex-Isla de Cuba, 1886), 1,125 tons, 10 knots, 2 6-in., 2 6-pdr., 6 3-pdr., 2 1-pdr., 1 m. ; **General Salom** (ex-U.S. Atlanta, 1884), 750 tons, 12 knots, 1 3-in., 4 6-pdr., 2 m. ; **Miranda** (Clydebank, 1895), 200 tons, 10 knots, 5 6-pdr.

TUGS.—**Aragua** (ex-Caroni), 154 tons, 7 knots, 1 m. ; **José Felix Ribas** (ex-Zumbador, 1894), 300 tons, 10 knots, 2 6-pdr., 1 m.

RIVER GUNBOATS.—2 in number.

YACHTS.—**Maracay** (1902), 800 tons, 8 knots, 2 3-in., 2 A.A., 1 m. ; **Leandro** (ex-Dr. Brinkley, U.S.A., 1925), 320 tons, 18 knots, 2 1·46-in.

YUGOSLAVIA.

DESTROYERS.—**Dubro nik** (Yarrow, 1932), 1,880 tons, 42,000 S.H.P., 37 knots, 4 5·5-in., 2 3·4-in., 6 1·5-in. A.A., 4 2-pdr., 2 triple 21-in. torpedo tubes, 2 depth charge throwers, 40 mines ; **Beograd** (Nantes, 1939), and **Ljubljana** (Split, 1939), 1,190 tons, 40,000 S.H.P., 38 knots, 4 4·7-in., 4 1·57-in. A.A., 2 triple 21-in. torpedo tubes, 30 mines ; 1 in number (building at Split), 1,875 tons, 38 knots, 5 5·5-in., 10 1·57-in. A.A., 2 m., 6 21-in. torpedo tubes. Two others building.

TORPEDO BOATS.—**T. 1-8** (ex-Austrian, 1913-15), 200 tons, 5,000 S.H.P., 28 knots, 2 2·5-in. A.A., 2 m., 2 21-in. torpedo tubes.

MOTOR TORPEDO BOATS.—**Durmitor**, **Dinara**, **Kajmakalan**, **Orsen**, **Rudnik**, **Suvobor**, **Triglav**, and **Velebi** (Bremen, 1936-37), 92 ft., 62 tons, 34 knots, 1 1·57-in. A.A., 2 21-in. torpedo tubes ; **Cetnik** and **Uskok** (Thornycroft, 1927), 59 ft., 13 tons, 40 knots, 1 m., 2 18-in. torpedo tubes.

SUBMARINES.—**Hrabri** and **Nebojsca** (Armonstrong, 1928), 870/1,146 tons, 2,400/1,600 B.H.P., 15/10 knots, 2 4-in., 6 21-in. torpedo tubes ; **Smeli** and **Osvetnik** (Nantes, 1929), 570/797 tons, 1,480/1,120 S.H.P., 14·5/9·2 knots, 1 4-in., 1 2-pdr. A.A., 1 m., 6 21-in. torpedo tubes.

RIVER MONITORS.—**Varda** (ex-Austrian Bosnia, Budapest, 1916), 530 tons, 13 knots, 2 4·7-in., 2 4·7-in. howitzers, 3 2·6-in. A.A., 2 1·85-in., 8 m. ; **Drava** (ex-Austrian Enns, Budapest, 1915), 450 tons, 13 knots, 2 4·7-in., 2 4·7-in. howitzers, 2 2·6-in. A.A., 7 m. ; **Sava** (ex-Austrian Bodrog, Budapest, 1904), 380 tons, 13 knots, 2 4·7-in., 1 4·7-in. howitzer, 1 2·6-in. A.A., 1 2·6-in. howitzer, 5 m. ; **Morava** (ex-Austrian Koros, Budapest, 1892), 390 tons, 9 knots, 2 4·7-in., 2 9-pdr., 3 m.

MINELAYERS.—**Galeb**, **Jastrebo**, **Kobac**, **Labud**, **Orao**, **Sokol** (ex-German M class, 1918-19), 330 tons, 15 knots, 2 3·9-in. H.A., 2 m., 40 mines.

- MINESWEEPERS.**—**Malinska**, **Marsan**, **Meljine**, **Mijet**, and **Mosor** (Yarrow, Kraljevica, 1931–32), 130 tons, 9 knots, 1 2·5-in. A.A. D2 (ex-Austrian, 1889), 78 tons, 17 knots, 2 1·45-in., 1 m.
- SEAPLANE TENDER AND DEPOT SHIP.**—**Zmaj** (Hamburg, 1929), 1,870 tons, 15 knots, 1 4-in. A.A., 10 seaplanes.
- SUBMARINE DEPOT SHIP.**—**Hvar** (ex-Vintali, Sunderland, 1896), 2,000 tons, 13 knots; **Sitnica** (ex-Najade, 1891), 370 tons, 9 knots, 2 8-pdr.
- SALVAGE VESSEL.**—**Spasilac** (Kiel, 1930), 740 tons, 15 knots.
- TRAINING SHIPS.**—Old Cruiser **Dalmacisa**, (ex-German Niobe, Bremen, 1901), 2,360 tons, 22 knots, 6 8·4-in. A.A., 2 19·7-in. torpedo tubes; three masted schooner **Jadran** (Hamburg, 1933), 710 tons, auxiliary motor, 8 knots, 2 2-pdr.
- YACHTS.**—**Vila** (ex-Dalmata, 1896), 230 tons, 12 knots; **Dragor** (1928) 250 tons, 20 knots.
- TUGS.**—**Jaki** (1915), 360 tons, 15 knots, 2 1·85-in.; **Mocni** (Antwerp, 1939), 260 tons, 11 knots, 2 1·85-in.; **Silni** (1914), 200 tons, 10 knots, 2 1·85-in.; **Marljivi** (1898), 130 tons, 10 knots; **Snasni**, 100 tons, 10 knots; **Ustrajni** (1917), 160 tons, 9 knots; **Cer** (1909), 250 tons, 15 knots, 2 m.; **Sisak** (ex-Triglav, 1915), 90 tons, 11 knots, 2 m.; **Sabak** (ex-Avala), 90 tons, 8 knots, 2 m.
- PATROL BOATS.**—**Granicar** and **Strazar** (1929), 36 tons, 9 knots, 1 8-pdr.

BRITISH AND FOREIGN FLOTILLAS.

Great Britain.

Name or Number	Built by.	Completed.	Dimensions.			Number of Screws.	Standard Displacement.	Horse-Power.	Mean Speed on Trial, or expected.	Armament.	Torpedo Tubes.	Complement ('W ar')
			Length (Extreme).	Beam.	Draught.							
FLOTILLA LEADERS.												
			ft. ins.	ft. ins.	ft. ins.		Tons.		Knots.			
<i>Tribal Class :</i> Number uncertain	Building in Australia											
Two in number ..	Building in Canada											
Asbanti	Denny	1938	}	36 6	..	2	1870	44,000	36½	8 4·7-in. guns 7 smaller.	1 q. 21"	200
Bedouin	Vickers, Walker	1939										
Eskimo .. ..	.. ..	1938									
Matabele	Scotts	1939										
Punjabi .. ..	.. ..	1939									
Sikh	Stephen	1938										
Somali	Swan Hunter ..	1938										
Tartar .. ..	.. ..	1939									
Maori	Fairfields	1938										
Nubian	Thornycroft ..	1938										
Zulu	Stephen & Sons	1938										
Inglefield	Cammell Laird	1937	..	34 0	..	2	1530	38,000	36½	{ 5 4·7-in. 2 5-in. M. 5 smaller	2 Q. 21"	175
Faulknor	Yarrow	1935	313	33 9	8 8	2	1460	38,000	36½			
Duncan	Portsmouth Dockyard	1933	329	33 0	8 8	2	1400	36,000	35½	{ 4 4·7-in. 1 3-in. A.A.	2 Q.	175
Codrington ..	Swan Hunter ..	1930	345·0	33·9	10·0	2	1540	39,000	35	{ 5 4-in. 2 2-pdr. 1 M., 4 L.		
Wallace	Thornycroft ..	1925	329	31 11	12 4	2	1480	40,000	36	{ 5 4·7-in. 1 3-in. A.A. 2 2-pr. A.A.	2 T. 21"	182
Keppel	"	1925										
Broke, ex-Roo ..	"	1918	332 6	21 9	12 3	2	1530	40,000	36·5	{ 5 4·7-in. 1 3-in. A.A. 2 2-pr. A.A.	2 T. 21"	182
Douglas	Cammell Laird ..	1918										
Campbell .. ..	.. ..	1918									
Mackay, ex-Claverhouse ..	Hawthorn Leslie	1919										
Malcolm .. ..	.. ..	1919									
Montrose .. ..	.. ..	1918									

† Escort vessel armed with 4-in. guns.

DESTROYERS.

Name or Number.	Built by.	Completed.	Dimensions.			Number of Screws.	Standard Displacement.	Horse-Power.	Mean Speed on Trial, or expected.	Armament.	Torpedo Tubes.	Complement (War).
			Length (Extreme).	Beam.	Draught.							
			Feet.	ft. ins.	ft. ins.		Tons.		Knots.			
<i>Napier, Milne, Laforey, Kelly, Javelin, Intrepid, Hero, Greyhound, Pearlless, Eclipse, Defender, Beagle, & Acasta Classes:</i>												
Napier (leader)	Fairfield	1935					
Nestor	John Brown	Bldg.	1920	4·7 in.
Nerissa .. ..	.. ..	..								
Nizam	Denny .. ..	..									
Noble	Thornycroft	1693	4·7 in.
Nonpareil .. ..	.. ..	..								
Norman	Scotts .. ..	..									
Norseman	Parsons (Hull's by Vickers)	..	Bldg.	1690	4·7 in.
Milne (leader)	.. ..	..								
Marksman .. ..	.. ..	..								
Marne
Martin .. ..	.. ..	..								
Matchless .. ..	.. ..	..								
Meteor
Musketeer .. ..	.. ..	..								
Myrmidon .. ..	.. ..	..								

Torpedo tubes: T. = triple.

Q. = quadruple.

Great Britain—continued.

Name or Number.	Built by.	Completed.	Dimensions.			Number of Screws.	Standard Displacement.	Horse-Power.	Mean Speed on Trial, or expected.	Armament.	Torpedo Tubes.	Complement (War).	
			Length (Extreme.)	Beam.	Draught.								
			Feet.	Feet.	Feet.		Tons.		Knots.				
DESTROYERS—													
Javelin, etc., Classes													
—continued.													
Laforey (leader)	Yarrow	} Bldg.	..	..	..	..	1935	..	..	4·7 in.	..	..
Lance .. ..			..	..	..	..	..	..	..	..	..	..
Larne			Cammell Laird	1920	4·7 in.
Lively
Legion	Hawthorn Leslie	} Bldg.	..	..	..	..	1920	..	..	4·7 in.	..	..
Lightning ..	..		..	..	..	..	..	..	..	..	..	..
Lookout .. ..	..		..	..	..	..	..	..	..	..	..	..
Loyal	Scotts .. ..		..	..	..	..	..	..	..	..	..	..
Khartoum ..	Swan Hunter	} Bldg.	..	..	..	..	1690	40,000	36	6 4·7 in. guns 7 smaller	10 21"	183
Kelvin	Fairfield ..		..	..	..	..	..	..	..	..	..	..
Kimberley ..	Thornycroft ..		..	..	..	..	..	..	..	..	..	..
Kingston ..	White .. ..		..	..	..	..	..	..	..	..	..	..
Kipling	Yarrow	} Bldg.	..	..	..	..	1690	40,000	36	6 4·7 in. guns 7 smaller	10 21"	175
Jackal	John Brown ..		..	..	..	..	1695	..	..	..	..	..
Jaguar	Denny .. ..		..	..	..	..	1690	..	..	..	..	..
Janus	Swan Hunter ..		..	..	..	..	..	..	..	..	..	..
Javelin	Thornycroft ..	} Bldg.	..	..	..	..	1690	40,000	36	6 4·7 in. guns 7 smaller	10 21"	175
Jervis (leader)	Hawthorn Leslie		..	..	..	..	1695	..	..	..	..	..
Jupiter	Yarrow .. ..		..	..	..	..	1690	..	..	..	..	..
Icarus .. ..	..		..	..	..	..	..	..	..	..	..	..
Ilex	J. Brown ..	} Bldg.	..	..	..	..	..	..	..	..	..	..
Isis	Yarrow .. ..		..	..	..	..	..	..	..	..	..	..
Intrepid	J. S. White		..	..	..	..	..	..	..	..	..	..
Impulsive ..	..		..	..	..	..	..	..	..	..	..	..
Hero	Vickers	} Bldg.	..	..	..	..	..	..	..	..	..	..
Hotspur	(Parsons)		..	..	..	..	..	..	..	..	..	..
Hasty	Scotts .. ..		..	..	..	..	..	..	..	..	..	..
Havock	Denny .. ..		..	..	..	..	..	..	..	..	..	..
Griffin	Vickers-Armstrong	} Bldg.	..	..	..	..	..	..	..	..	..	..
Garland .. ..	..		..	..	..	..	..	..	..	..	..	..
Gallant	Fairfields		..	..	..	..	..	..	..	..	..	..
Foresight ..	Stephen & Sons		..	..	..	..	..	..	..	..	..	..
Foxhound ..	Cammell Laird	} Bldg.	..	..	..	..	..	..	..	..	..	..
Fortune .. ..	..		..	..	..	..	..	..	..	..	..	..
Forester	Brown		..	..	..	..	..	..	..	..	..	..
Fury	J. S. White		..	..	..	..	..	..	..	..	..	..
Fame .. ..	..	} Bldg.	..	..	..	..	..	..	..	..	..	..
Firedrake ..	Parsons/Vickers-Armstrong		..	..	..	..	..	..	..	..	..	..
Eclipse .. ..	..		..	..	..	..	..	..	..	..	..	..
Echo	Denny .. ..		..	..	..	..	..	..	..	..	..	..
Escapade ..	..	} Bldg.	..	..	..	..	..	..	..	..	..	..
Electra	Scotts .. ..		..	..	..	..	..	..	..	..	..	..
Encounter ..	Hawthorn Leslie		..	..	..	..	..	..	..	..	..	..
Express	Swan Hunter		..	..	..	..	..	..	..	..	..	..
Decoy	Thornycroft	} Bldg.	317½ (b.p.)	33	8 6	2	1375	36,000	36	4 4·7-in. 1 3-in. A.A. 7 smaller	2 Q. 21"	145	
Beagle .. ..	..		..	..	..	..	..	..	..	..	..	..
Boadicea ..	Brown .. ..		..	..	..	..	..	..	..	..	..	..
Boreas	Hawthorn Leslie		..	..	..	..	..	..	..	..	..	..
Brilliant ..	Palmer	} Bldg.	323	32½	8½	2	1360	34,000	35½	4 4·7-in., 2 2-pr. 1 M., 4 L.	2 Q. 21"	140	
Bulldog .. ..	..		..	..	..	..	..	..	..	..	..	..
Achates	Swan, Hunter		..	..	..	..	..	..	..	..	..	..
Active .. ..	..		..	..	..	..	..	..	..	..	..	..
Antelope ..	Brown	} Bldg.	323	32½	8½	2	1350	34,000	35½	4 4·7-in., 2 2-pr., 1 M., 4 L.	2 Q. 21"	140	
Anthony ..	Hawthorn Leslie		..	..	..	..	..	..	..	..	..	..
Arrow .. ..	..		..	..	..	..	..	..	..	..	..	..
..	Scotts .. ..		..	..	..	..	..	..	..	..	..	..
..	Vickers-Armstr.	} Bldg.	323	31½	9	2	1350	39,500	37	4 4·7-in., 2 2-pr., 1 M., 4 L.	2 T. 21"	140	
Amazon	Thornycroft ..		..	..	..	..	..	..	..	..	..	..
..	
..	
..	
Thornycroft Type:													
Amazon	Thornycroft ..	} Bldg.	323	31½	9	2	1350	39,500	37	4 4·7-in., 2 2-pr., 1 M., 4 L.	2 T. 21"	140	
..	
..	
..	
..	
Yarrow Type:													
Ambuscade ..	Yarrow	} Bldg.	322	31	8½	2	1170	33,000	37	4 4·7-in., 2 2-pr., 1 M., 4 L.	5 21"	140	
..	
..	
..	

Torpedo tubes: T. = triple. Q. = quadruple.

Great Britain—continued.

Name or Number.	Built by.	Completed.	Dimensions.			Number of Screws.	Standard Displacement.	Horse-Power.	Mean Speed on Trial or expected.	Armament.	Torpedo Tubes.	Complement (War).
			Length. (Extreme).	Beam.	Draught.							
			Feet.	Feet.	Feet.		Tons.		Knots.			
DESTROYERS—												
Admiralty "S" Class:												
Saladin	Stephen	1919	276	26½	10½	2	905	27,000	36	3 4-in., 1 2-pr., 1 M., 4 L.	2 D. 21"	103
Sabre	"	1918										
Sardonyx	"	1919										
Scimitar	Brown	1918										
Tenedos	Hawthorn Leslie	1919										
Thanet	"	1919										
Thracian	"	1922										
Stronghold	Scott	1919	312	29½	10½	2	1120	27,000	34	4 4·7 in., 2 2-pr., 1 M., 4 L.	2 T.	130
Scout	Brown	1918										
Shikari	{Doxford } {Chatham }	1924										
Admiralty "V" Class:												
Vansittart	Beardmore	1919	312	29½	10½	2	1120	27,000	34	4 4·7 in., 2 2-pr., 1 M., 4 L.	2 T.	120
Venomous	Brown	1919										
Verity	"	1919										
Volunteer	Denny	1919										
Veteran	Brown	1919										
Wanderer	Fairfield	1919										
Whitshed	Swan Hunter	1919										
Wild Swan	"	1919	312	29½	10½	2	1100	27,000	34	4 4-in., 1 2-pr., 1 M., 4 L.	2 T.	120
Witherington	J. S. White	1919										
Wivern	"	1919										
Wolverine	"	1920										
Worcester	"	1922										
Whitehall	{Swan Hunter } {Chatham }	1925										
Walpole	Palmer	1918											312	29½	10½	2	1100	27,000	34	4 4-in., 1 2-pr., 1 M., 4 L.	{ 1 T. 1 D. 3 }	130
Windsor	Scott	1918										
Wrestler	Swan Hunter	1918										
†Winchester	J. S. White	1918										
†Wolfhound	Fairfield	1918										
†Westminster	Scott	1918										
Westcott	Denny	1918										
Walker	Denny	1918										
Warwick	Hawthorn Leslie	1918										
Watchman	Brown	1918										
Winchelsea	J. S. White	1918										
Vanessa	Beardmore	1918										
†Vanity	"	1918										
Vidette	Stephen	1918										
Vimy (late Van- couver)	Beardmore	1918	312	29½	10½	2	1090	27,000	34	4 4-in., 1 2-pr., 1 M., 4 L.	{ 1 T. 1 D. 3 }	130
Vanoc	Brown	1917										
Vanquisher	"	1917										
Velox	"	1918										
†Verdun	Hawthorn Leslie	1917										
Versatile	"	1918	312	30½	10½	2	1120	30,000	35	4 4-in., 1 2-pr., 1 M., 4 L.	2 T.	130
Vesper	Stephen	1918										
Vivacious	Yarrow	1917										
Vortigern	J. S. White	1918										
Thornycroft "V" Class:												
Witch	{Thornycroft } {Devonport }	1924	312	30½	10·9	2	1140	30,000	35	4 4·7 in., 2 2-pr., 1 M., 4 L.	2 T.	130
Wishart	Thornycroft	1920										
Viceroy	"	1918										
Viscount	"	1918	312	30½	10½	2	1120	30,000	35	4 4-in., 1 2-pr., 1 M., 4 L.	2 T.	130
Admiralty "R" Class:												
Skate	Brown	1917	276- 276½	26½	10½	2	900	27,000	36	3 4-in., 1 2-pr., 1 M., 4 L.	2 D. 21"	98

Torpedo tubes: D. = double. T. = triple
 † Escort vessels armed with 4-in. guns.

BRITISH FLOTILLAS.
Great Britain—continued.

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Name or Number.	Built by.	Completed.	Dimensions.			Number of Screws.	Standard Displacement.	Horse Power.	Mean Speed on Trial, or expected.	Armament.	Torpedo Tubes.	Complement (War).	Fuel. Oil.
			Length (Extreme).	Beam.	Draught.								
			Ft.	Ft.	Ft.		Tons.		Knots.				
DESTROYERS—													
<i>Town Class (ex U.S.N.):</i>													
Churchill (ex-Herndon) ..	Newport News S.B. Co. ..	1919-1920	314	43	9-8	2	1,190	25,000	35	4 4-in., 1 3-in. A.A.	4 Trip. 21-in.	122	375
Chesterfield (ex-Wood) ..													
Clare (ex-Upshur) ..													
Beverley (ex-Branch) ..													
Broadway (ex-Hunt) ..													
Burnham (ex-Alden) ..													
Cameron (ex-Welles) ..	Bethlehem S.B. 6	1919	314	43	9-8	2	1,190	27,000	35	4 4-in., 1 3-in. A.A.	4 Trip. 21-in.	122	375
Belmont (ex-Aulick) ..													
Bradford (ex-McLanahan) ..													
Burwell (ex-Laub) ..													
Buxton (ex-Edwards) ..													
Sherwood (ex-Rodgers) ..													
Ramsey (ex-Meade) ..													
Reading (ex-Bailey) ..													
Ripley (ex-Shubrick) ..													
Rockingham (ex-Swasey) ..													
*St. Croix (ex-McCook) ..													
*St. Francis (ex-Bancroft) ..													
Caldwell (ex-Hale) ..	Bath I.W.	1919-1921	314	43	9-5	2	1,090	24,000	35	4 4-in., 1 3-in. A.A.	4 Trip. 21-in.	122	286
Castleton (ex-A. Ward) ..													
Campbeltown (ex-Buchanan)													
Lancaster (ex-Philip) ..													
Mansfield (ex-Evans) ..													
Montgomery (ex-Wickes)	Mare Island Union I.W. New York Cramp	1919-1918	314	43	9-5	2	1,090	24,000	35	4 4-in., 1 3-in. A.A.	4 Trip. 21-in.	122	286
Wells (ex-Tillman) ..													
Salisbury (ex-Claxton) ..													
Richmond (ex-Fairfax) ..													
Leamington (ex-Twiggs) ..													
Lincoln (ex-Yarnall) ..													
*Hamilton (ex-Kalk) ..	Fore River S.B. Co.	1918-1920	314	43	9-8	2	1,060	27,000	35	4 4-in., 1 3-in. A.A.	4 Trip. 21-in.	122	283
Georgetown (ex-Maddox) ..													
Brighton (ex-Cowell) ..													
Roxborough (ex-Foote) ..													
Newport (ex-Sigourney) ..													
*Niagara (ex-Thatcher) ..	Newport News S.B. 6.	1918-1920	314	43	9-8	2	1,060	27,000	35	4 4-in., 1 3-in. A.A.	4 Trip. 21-in.	122	283
Charlestown (ex-Abbot) ..													
St. Albans (ex-Thomas) ..													
St. Mary's (ex-Doran) ..													
*Columbia (ex-Haraden) ..													
Newark (ex-Ringgold) ..	Union I.W.	1918	315	53	7	3	1,020	18,500	30	4 4-in., 1 3-in. A.A.	4 Trip. 21-in.	122	260
Newmarket (ex-Robinson) ..													
*Annapolis (ex-Mackenzie) ..													
*St. Clair (ex-Williams) ..	Union Plant												
Leeds (ex-Connor) ..	Cramp	1918	315	53	7	3	1,020	18,500	30	4 4-in., 1 3-in. A.A.	4 Trip. 21-in.	122	260
Ludlow (ex-Stockton) ..													
Lewes (ex-Conway) ..													

• Royal Canadian Navy.

Great Britain—continued.

SUBMARINES.

Name or Number.	Where Built.	Completed.	Dimensions.			No. of Sorews.	Displacement.	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Complement (War).
			Length (Extreme).	Beam.	Draught.							
			Feet.	Feet.	Feet.		Tons.		Knots.			
<i>Unity Class :</i>												
Utmost ..												
Upholder ..												
Unique ..												
Ursula ..	Vickers.. ..	1938	180	16-1	12-9	..	540 730	615 825	11½ 10	2 small guns	6	27
<i>Triton Class :</i>												
Talisman ..	Cammell Laird..	Bldg.	..	..	..	..	1,080			4-in.	..	..
Torbay ..	Chatham ..	Bldg.					1,576					
Thunderbolt (ex-Thetis) ..												
Triumph ..	Cammell Laird	1939	265	28½	12	..	1,080	2,500	15½	1 4-in. gun	6	53
Trident ..							1,576	1,450	9			
Tribune ..												
Taku ..	Cammell Laird	Bldg.	..	..	..	..		
Truant ..	Vickers ..	1939										
Tuna ..	Scott's ..											
Tigris ..	Chatham	Bldg.										
<i>Thames Class :</i>												
Seyvern ..	Vickers-Armstrong	1935	345	28	13-7	2	1,880	10,000	22½	1 4-in., 2 smaller	..	60
Clyde ..							2,723	2,500	10			
<i>Porpoise Class :*</i>												
Porpoise ..	Vickers-Armstrong	1933	289	29-8	13-8	..	1,500	3,300	15	1 4-in., 2 smaller	6	55
							2,063	1,630	8½			
Rorqual ..	Vickers ..	1935	271½	25½	15	2	1,520	3,300	15½	1 4-in., 2 smaller	6	55
							2,157	1,630	8½			
<i>Swordfish Class :</i>												
Sunfish ..	Chatham ..	1937	208-7	24	10-5	2	670	1,550	13½	2-in., 1 smaller	6	40
Seawolf ..	Scott's ..	1934					980	1,300	10			
Sealion ..	Cammell Laird..	1938					640	1,550	13½			
Sturgeon ..	Chatham ..	1933	202-5	24	10-5	2	927	1,300	10			
<i>Rainbow Class :</i>												
Regent ..	Vickers-Armstrong	1930	290	29-8	13-8	2	1,475	4,400	17½	1 4-in., 2 smaller	8	53
Rover ..		1931					2,036					
<i>Parthian Class :</i>												
Parthian ..	Chatham ..	1931	290	29-8	13-7	..	1,475	1,320	9			
Proteus ..	Vickers-Armstrong	1930					1,475					
Pandora ..							2,040					
<i>Odin Class :</i>												
Olympus ..	Beardmore ..	1930	283½	29-8	13-7	..	1,475	4,400	17½	1 4-in., 2 Lewis	8	53
Oairis ..	Vickers ..	1929					2,038	1,320	9			
Otus ..	Vickers ..	1929										
<i>Oberon Class :</i>												
Oberon ..	Chatham ..	1927	270	28	13-2	..	1,311	2,950	15	1 4-in., 2 Lewis	8	53
							1,830	1,350	9			
Otway ..	Vickers ..	1927	275	27-7	13-3	..	1,354	3,000	15½	1 4-in., 2 Lewis	8	93
							1,872	1,350	9			
<i>L Class :</i>												
L27 ..	Vickers ..	1926	238½	23½	11-7	..	760	2,400	17½	1 4-in., 1 Lewis	4	41
L26 ..	Vickers ..	1926					1,080	1,600	10½			
L23 ..	Vickers ..	1924										
<i>H Class :</i>												
H60 ..	Beardmore ..	1920	171	15-75	12-5	2						
H44 ..	Armstrong ..	1920										
H43 ..	Armstrong ..	1919										
H34 ..	Cammell Laird..	1919					410	480	13	1 Lewis	4	23
H33 ..	Cammell Laird..	1919					500	320	10½			
H32 ..	Vickers ..	1919										
H28 ..	Vickers ..	1918										

* Minelaying submarines.

BRITISH FLOTILLAS.
Great Britain—continued.

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Name.	Displacement.	Length (Extreme).	Beam (Extreme).	Draught.	Horse-Power.	Where built.	Maker of Machinery.	Date of Launch.	Date of Completion.	Armament.	Speed (knots).	Complement.
<i>Hunt Class:</i>		ft. ins.	ft. ins.	ft. ins.								
Atherstone	..	..	..	..	..	Cammell Laird	Cammell Laird					
Berkeley	..	..	..	..	..		
Cattistock	..	..	..	..	..	Yarrow	Yarrow					
Cleveland	..	..	..	..	..		
Cotswold	..	..	..	..	..		
Cottesmore	..	..	..	..	..		
Eglinton	..	..	..	..	..	Vickers Walker	Parsons					
Fernie	..	..	..	..	..	J. Brown	J. Brown					
Garth	..	..	..	..	..		
Hambledon	..	..	..	..	..	Swan Hunter	Wallsend Slipway					
Holderness	..	..	..	..	..		
Mendip	..	..	..	..	..		
Meynell	..	..	..	..	..		
Pytchley	..	..	..	..	..	Scotts	Scotts					
Quantock	..	..	..	..	..		
Quorn	..	..	..	..	..	J. S. White	J. S. White					
Southdown	..	..	..	..	..		
Tynedale	..	..	..	..	..	Stephens	Stephens					
Whaddon	..	..	..	..	..		
Farndale	..	..	..	..	..		
Avondale	..	..	..	..	..		
<i>SLOOPS.</i>												
Erne	1250	..	..	..	4,300	Furness	Richardson Westgarth	..	..	6 1/2-in. H.A. 10 smaller		
Ibis	..	..	..	..	..	J. S. White	J. S. White	1937	1938			
Egret	1200	282	37 6	8 4	3,600	Denny	Denny	1937	1938	8 1/2-in., 5 smaller	19 1/2	
Auckland	..	..	..	..	..	Thornycroft	Thornycroft	1938	1939			
Pelican	..	..	..	..	..		
Black	1250	..	..	..	4,300	Yarrow	Yarrow	1939		6 1/2-in. H.A. 10 smaller	19 1/2	
Swan	..	..	..	..	..		
Flamingo	1085	282	37 0	8 6	3,300	J. Brown	J. Brown	1934	1935	4 1/2-in. guns and 2 on deposit	18 1/2	125
Enchantress	..	..	..	..	..					4 3-pr.		
Stork	1100	282	37 0	8 6	3,300	Denny	Denny	1936	1936	6 1/2-in. guns 2 3-pr. 5 smaller	18 1/2	..
<i>CORVETTES.</i>												
<i>Flower Class</i>												
Fleur de	..	..	..	..	..			1940- 41				
Lys	..	..	..	..	..		
Gladiolus	..	..	..	..	..		
Marigold	..	..	..	..	..		
Eyebright	..	..	..	..	..		
etc.	..	..	..	..	..		
58 in No.	..	..	..	..	..			1940- 41				
<i>Canadian:</i>												
Chambly	..	..	..	..	..		
Mosesaw	..	..	..	..	..			1940- 41				
etc.	..	..	..	..	..		
80 in No.	..	..	..	..	..		
Kingfisher	510	234 b.p.	26 6	6 6	3,600	Fairfield	Fairfield	1935	1935		20	..
Mallard	..	..	..	..	..	Stephen	Stephen	..	1936		20	60
Puffin	..	..	..	..	..		
Sheldrake	530	234 b.p.	26 6	6 6	3,600	Thornycroft	Thornycroft	..	1937	1 1/2-in. gun 8 smaller	20	..
Kittiwake	..	..	..	..	..	Yarrow	Yarrow	..	1938		20	..
Widgeon	..	..	..	..	..	Denny	Denny					
Guillemot	580	..	..	..	..	J. S. White	J. S. White		1939			
Shearwater	..	..	..	..	..		
<i>SLOOPS.</i>												
Leith	..	..	..	..	..	Devonport		1933	1934	2 1/2-in. guns. 1 3-in.		
Lowestoft	990	266	36 0	7 6	2,000	Devonport	J. S. White	1935	1935	12 smaller	16 1/2	100
Wellington	..	..	..	..	..	Devonport		1934	1935			
London'dry	..	..	..	..	..	Devonport						
Deptford	..	..	..	..	..	Chatham						
Aberdeen	990	..	..	..	..	Devonport	Thornycroft	1935		3 1/2-in. 12 smaller 4 1/2-in. 12 smaller		
Fleetwood	..	..	..	..	..	Devonport						
<i>MINE- SWEEPERS.</i>												
60 in No.	..	..	..	..	..	Building in Canada	..	1941-2				
<i>Halcyon Class:</i>												
Halcyon	..	..	..	..	..	J. Brown	J. Brown	1934	1934	2 1/2-in. 5 smaller	17	80
Harrier	815	246	33 6	7 3	1,770	Thornycroft	Thornycroft	1935	1935			
Hussar	..	..	..	..	..	Hamilton	Beardmore	1935	1935			
Speedwell	..	..	..	..	..	J. S. White	J. S. White	1935	1936	2 1/2-in. 9 smaller	17	80
Niger	815	246	33 6	7 7	2,000			1935	1936			
Salamander	..	..	..	..	..			1936	1937	2 1/2-in. 5 smaller	..	..
Hebe	..	..	..	..	..	Devonport		1937	1937			
Sharp	..	..	..	..	..			1937	1937			
shooter	..	..	..	..	..		
Hazard	..	..	..	..	..	Wm. Gray	..	1937	1938		..	..
Gleaner	..	..	..	..	..		

Great Britain—*continued.*

MINESWEEPERS AND SLOOPS

Name.	Displacement.	Length (Extreme).	Beam (Extreme).	Draught.	Horse-Power.	Where Built.	Maker of Machinery.	Date of Launch.	Date of Completion.	Armament.	Speed (knots).	Complement.
		ft. ins.	ft. ins.	ft. ins.								
<i>Halcyon</i> Class—cont. Gossamer Leda Seagull Franklin Jason Scott Bramble Britomart Speedy	815 830 .. 875	230 b.p.	33 6	7 0	1,750	Hamilton's Devonport Alfas Caledon Devonport Devonport J. Hamilton	Stephen Richardsons, Westgarth Thornycroft Parsons Barclay Curle Barclay Curle J. S. White	1937 1937 1938	1938 1938 1939	2 4-in. H.A. 5 smaller .. 2 4-in. H.A. 5 smaller	17 17 17	..
SLOOPS <i>Shorham</i> Class: Repeat <i>Shore-</i> <i>ham</i> Class: Falmouth												
Milford Weston	1060					Devonport	Hawthorn Lealle Yarrow Yarrow	1932 1932 1933	1932 1932 1933	2 4-in. A.A. 4 3-pr. 8 L.	16½	100
Bideford Rochester Fowey Shoreham	1105	281 4	35 0	8 0	2,000 P.T. (G.)	Devonport Chatham Devonport Chatham	J. S. White & Devonport J. S. White & Chatham J. S. White & Devonport J. S. White & Chatham	1931 1932 1930 1930	1931 1932 1931 1931	1 4-in., 1 4-in. A.A. 4 3-pr. 8 L. Fowey 2 4-in. H.A. 13 smaller guns	16½	100
<i>Hastings</i> Class: Hastings Folkestone Scar- borough	1025 1045	266 4	34 1	9 1	2,000 P.T. (G.)	Devonport Swan, Hunter Swan, Hunter	Devonport Hawthorn, Lealle Hawthorn, Lealle	1930 1930 1930	1931 1930 1930	1 4-in., 1 4-in. A.A. 2 3-pr. 8 L. Hastings 2 4-in., 9 smaller	16½	..
<i>Bridgewater</i> Class: Bridgewater Sandwich	1045					Hawthorn Lealle	Hawthorn Lealle	1928 1929	1929 1929	2 4-in. A.A. Bridgewater 10 smaller, Sand- wich 11 smaller	16½	95
<i>Arabis</i> Class: Lupin Rosemary	1175	267 9	33 6	12 0	2,000 recip.	Richardson Duck	Blair	1915	1916	1 4-in., 2 3-pr. 2 M., 8 L.	16 -17	100
<i>Acacia</i> Class: Foxglove	1165	262 6	33 0	12 6	1,800 recip.	Dunlop Bremner	Dunlop Bremner	1915	1915	2 4-in., 4 3-pr. 2 3-pr., 8 L.	16-17	100

Great Britain—*continued.*

MINESWEEPERS, RIVER GUNBOATS.

Name.	Displacement.	Length (Extreme).	Beam (Extreme).	Draught.	Horse-Power.	Where built.	Maker of Machinery.	Date of Launch.	Date of Completion.	Armament.	Speed (knots).	Complement.
MINESWEEPERS												
Aberdare . .						Allan	Allan	1918	1918			
Abingdon . .						Allan	G. Clark	1918	1919			
Albury . .						Allan	Allan	1919	1919			
Alresford . .						Allan	W. H. Allen	1919	1919			
Bagshot . .						Ardrossan Dry Dock Co.	W. H. Allen	1918	1919			
Derby . .						Clyde S.B. Co.	Clyde S. B. Co.	1918	1918			
Fermoy . .						Dundee	Cooper & Greig	1919	1919	1 4-in., 1 12- pr. A.A.		
Fareham . .						Dunlop, Bremner	Dunlop, Bremner	1918	1918	Alresford, Caterham, Ross and Saltburn no armament.	16	78
Elgin . .						Simons	Simons	1918	1918			
Sutton . .	710	231 0	28 7	9 0	2,200 recip.	McMillan	Yarrow					
Saltash . .						Murdock & Murray	Do.	1918	1919			
Saltburn . .						Do.	Do.					
Selkirk . .						Do.	D. Rowan	1918	1919			
Ross . .						Lobnitz	Lobnitz	1919	1919			
Widnes . .						Napier	Rowan	1918	1918			
Harrow . .						Eltringham	Wallsend Shipway	1918	1918			
Lydd . .						Fairfield	Fairfield	1918	1919			
Stoke . .						Rennoldson	Shields	1918	1918			
Pangbourne .						Lobnitz	Lobnitz					
Tedworth . .	675	231 0	28 0	9 0	1,800 recip.	Simons	Simons	1917	1917	1 3-in. A.A.	16	35
Fitzroy . .						Lobnitz	Lobnitz					
Kellett . .	800	231 0	28 7	7 6	2,200 recip.	Simons	Simons	1919	1919	1 3-pr.	16	86
AUSTRALIAN MINESWEEPERS.												
Number uncertain	..	..	..	..	..	..	..	Bldg.				
CANADIAN MINESWEEPERS.												
60 in No.	..	..	..	..	..	..	..	Bldg.				
12 special type	..	..	..	..	..	..	..	Bldg.				
RIVER GUN- BOATS.												
Scorpion . .	700	208 9	34 8	5 5	4,500	J. S. White	White	1937	1938	2 4-in.; 1 3.7-in. Howitzer, 12 smaller	17	..
Robin . .	226	150 b.p.	26 8	3 0	800 recip.	Yarrow	Yarrow	1934	1934	2 4-in.; 1 3.7-in. Howitzer, 10 smaller	12½	35
Dragonfly . .						Thornycroft	Thornycroft	1938	Bldg.			
Grasshopper .	585				3,800			1939	Bldg.			
Sandpiper . .	185	160 0 b.p.	30 8	1 10	600 recip.	Thornycroft	Thornycroft	1933	1933	1 3.7-in. Howit- zer, 16-pr., 8 L. 4-in.	11½	35
Locust . .	585					Yarrow	Yarrow		Bldg.			
Falcon . .	372	150 0	28 8	4 9	2,250 (G.)	Yarrow	Yarrow	1931	1931	1 3.7-in. Howit- zer, 26-pr., 8 L.	15	55
Gannet . .						Yarrow	Yarrow					
Petevel . .	310	185 0	29 0	4 0	2,250 (G.)			1927	1928		16	60
Seamew . .										2 3-in. A.A., 8 L.		
Tern . .	262	168 0	27 0	4 0	1,370 (G.)	Do.	Do.	1928 1927	1928 1927		14	60

Great Britain—*continued*.

RIVER GUNBOATS.

Name.	Displacement.	Length (Extreme).	Beam (Extreme).	Draught.	Horse-Power.	Where built.	Maker of Machinery.	Date of Launch.	Date of Completion.	Armament.	Speed (knots).	Complement.		
RIVER GUN- BOATS— <i>cont.</i>														
Aphis . .	625	237 6	36 0	4 6	2,000 recip.	Ailsa	Ailsa	1915	1915	2 6-in., 1 3-in. A.A., 1 2-pr., 8 L.	14	55		
Oicala . .						Barclay Curle	Barclay Curle	1915	1916	2 6-in., 1 3-in. A.A., 1 2-pr., 8 L.				
Cockchafer .						Do.	Do.	1915	1916	2 6-in., 1 3-in. A.A., 8 L.				
Gnat . .						Lobnitz	Lobnitz	1915	1915	2 6-in., 1 3-in. A.A., 1 2-pr., 8 L.				
Cricket . .														
Moth . .						Sunderland S.B. Co.	N.E. Marine	1915	1916	2 6-in., 1 3-in. A.A., 1 2-pr., 8 L.				
Scarab . .						Wood, Skin- ner	Do.	1915	1915	2 6-in., 1 3-in. A.A., 1 2-pr., 8 L.				
Tarantula .					Do.	Do.	1915	1916	1 6-in., 1 3-in. A.A., 1 2-pr. 8 L.					

Argentine Republic.

Name or Number.	Where Built.	Launched	Dimensions.			Number of Screws.	Displacement.	Horse-Power.	Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.	
			Length. (Extreme.)	Beam.	Draught.								Coal	Oil
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.	
FLOTILLA LEADERS—														
Cervantes (ex-Spanish Churrucá)	Cartagena ..	1925	318	31½	10½	2	1822	42,000	26	5 4-7 in., 1 3-in. A.A., 4 M.	2 triple 21-in.	160	—	540
Juan de Garay (ex- Spanish Gallano)		1928												
Mendoza ..		1929	335	31-8	12½	2	1466	46,000	36 (La Rioja 39-4 ft.)	5 4-7 in., 1 3-in. A.A., 2 2-pr., 4 M.	2 triple 21-in.	160	—	700
Tucuman ..	J. S. White, Cowan	1929												
DESTROYERS—														
Catamarca ..	Schichau ..	1911	298-7	27½	10	2	972	28,000	32	3 4-in. 2 1-pr.	4 21-in.	100	220	—
Jujuy ..	Germania ..	1910	295½	29-8	10	..	1000	28,000	34-7 ft.	3 4-in., 2 1-pr.	4 21-in.	100	200	—
Cordoba ..	Schichau ..	1910												
La Plata ..	Germania ..	1911												
San Juan ..	J. Brown ..	1937	323	33	8½	..	1850	34,000	35½	4 4-7 in., 3 smaller	2Q 21-in.	150	450	—
Misiones ..	Cammell	1937	323	33	8½	..	1350	34,000	35½	4 4-7 in., 3 smaller	2Q 21-in.	170	450	—
Santa Cruz ..	Laird	1937	323	33	8½	..	1350	34,000	35½	4 4-7 in., 3 smaller	2Q 21-in.	160	450	—
Buenos Aires ..	Vickers, Barrow	1937	323	33	8½	..	1350	34,000	35½	4 4-7 in., 3 smaller	2Q 21-in.	160	450	—
Entre Rios ..														
Corrientes ..														
SUBMARINES—														
Santa Fe ..	Taranto ..	1931												
Salta ..		1932	226½	21½	13	2	850	3,000	17-6	1 4-7 in.	8	41	—	—
Santiago del Estero		1933					1060	1,300	9	1 2-pr. A.A.	21-in.			

Torpedo tubes : Q = quadruple.

Brazil.

Name or Number.	Where Built.	Launched.	Dimensions.			Number of Screws.	Displacement.	Horse-Power.	Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.
			Length. (Extreme.)	Beam.	Draught.								Coal Oil
DESTROYERS—													
Amazona	Rio de Janeiro	Bldg.	360½ w.l.	34½	9 10	2	1500	42,000	26 5	5 5-in. 4 M. A. A.	3 21-in. (Q)	190	— 500
Araguay													
Acre													
Ajuricaba													
Apa													
Araguary													
Greenhalgh													
Marcilio Dias													
Maria E. Barros													
Planhy													
Mato Grosso	Yarrow ..	1909	240	22-6	7-5	2	500	8,000	27 (27-1- 28-7 on trials)	2 4-in., 4 3 prs.	2 18-in.	16	160 17
†Parahyba													
Rio Grande del Norte													
Santa Catharina													
Sergipe													
Maranhao (ex- Por- poise)	Thornycroft..	1913	265-2	26-5	10	2	934	22,500	31	{ 3 4-in., 1 3-pr.	2 dble. 21-in.	100	— 250
SUBMARINES—													
Humayta	Spezia (Ansaldo Fiat)	1927	282	25-6	14	2	1450	4,800	18-5	{ 14-7-in. A. A.; 4 M., 30 mines	{ 6 21-in.	55	— 160
Tamoya							1884	2,200	10				
Tymbira	Spezia (Orlando)	1937	197½	21	14½	..	620	1350	14	1 3-9-in. 2 M. A. A.	6 21-in.	33	..
Tupy							855	800	8				

† Training Ship.

Chile.

Name or Number.	Where Built.	Launched.	Dimensions.			Number of Screws.	Displacement.	Horse-Power.	Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.
			Length. (Extreme.)	Beam.	Draught.									Coal Oil
DESTROYERS—													
Serrano	Thornycroft's	1928	300	29	9	2	1090	28,000	35	3 4-7-in., 1 3-in.	2 triple 21-in.	130	— 340
Orella													
Riquelme													
Hyatt													
Videla													
Aldea	White.. ..	{ 1912 1913	330 p.p.	32-6	11-1	3	1860	30,000	31	6 4-in. 4 M.	4 18-in.	190	427 80
Almirante Lynch													
Almirante Condell													
SUBMARINES—													
Capitan Thompson	Vickers Arm- strong's	1920	275	27-5	14-8	2	1520 1990	2750 1300	15 9	1 4-in.	8 21-in.	54	200
Almirante Simpson		1929											
Capitan O'Brien ..		1928											
H 1. Gualcolda ..	Fore River, U.S.A.	1915	150-8	15-75	12-3	2	355 470	480 640	13 11	..	4 18-in.	22	— 17-5
H 2. Tegusolda ..													
H 3. Bucumilla ..													
H 4. Gualo													
H 5. Quidora													
H 6. Fresia													

3 submarines are projected.

Denmark.*

Name or Number.	Where built.	Launched.	Dimensions.			Number of Screws.	Displacement.	Horse-Power.	Speed.	Armament.	Torpedo Tubes	Complement.	Fuel.	
			Length (Extreme).	Beam.	Draught.								Coal	Oil
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.	
TORPEDO BOATS.														
FIRST CLASS—														
T4. Glenten ..	Royal Dockyard, Copenhagen	1934	198·9	19·5	7·8	2	285	6,000	27½	2 3·4-in., 2 ·78 M., 2 M.	6 17·7 in.	51	—	40
T5. Hogen ..														
T6. Ornen ..														
T3. Laxen ..														
T1. Dragen ..														
T2. Hvalen ..														
R4. Havkatten †														
R5. Sælen †														
R3. Nordkaperen †														
R2. Makrelen †														
S6. Narhvalen †														
S5. Havhesten †														
S4. Söhhunden †														
S2. Stören †														
S1. Springerer †														
P1. Hvalrossen †														
S3. Söridderen †	Yarrow & Co.	1911	126·3	15	9	2	110	2,000	24·3	2 6-pr. A.A.	1 18 in.	24	15	—
Two in number ..	Copenhagen	Bldg.	279	27·4	8	2	700	21,000	35	2 4-in. 4 1·5-in.	6 21 in.	..	..	..
SUBMARINES—														
Daphne. D1 ..	Royal Dockyard, Copenhagen	1926	161	16	8·2		305	900	13·4	1 3-in. A.A., 1 ·78 M.	6 18 in.	25	—	16
Dryaden. D2 ..							380	400	7					
Flora. C3 ..	"	1919	155·7	15·7	9	2	301	900	14·5	1 6-pr. }	5 18 in.	24	—	13
Bellona. C2 ..							369	640	10·5					
Rota. C1 ‡	"	..	133·3	13·4	8	2	181	450	13·5	1 6-pr.	3 18 in.	14	—	9
Galathea. B12 ..							231	340	9·8					
Triton. B10 ..	"	1914												
Ran. B9 ..	"	1915												
Havkalen. E3 ..	"	1937												
Havfruen. E2 ..	"	1937	155·6	15·3	9·4	2	320	600	15	2 1·5-in.	5 18 in.	20	..	..
Havmanden. E1	"	1936					420	220	8					
Havhornen ..	"	Bldg.												

* Under the control of Germany.

† Used as minesweepers.

‡ Used as patrol vessels.

§ Rota has one deck tube in addition.

France.

Name or Number.	Where Built.	Launched.	Dimensions.			Number of Screws.	Displacement.	Horse-Power.	Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.
			Length. (Extreme.)	Beam.	Draught.								
FLOTILLA LEADERS—													
Volta	Ch. de Bretagne, Nantes	1936	Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
Mogador	Lorient.. .. .	1937	451	41.1	15	2	2,884	92,000	38	{ 8 5.4-in., 2 1.5-in. A.A.	10 21.7 -in.	240	630
Le Fantasque	Lorient.. .. .	1934											
L'Audacieux	Ch. de la Méditerranée	1934	434½	39½	14	2	2,569	74,000	37	{ 5 5.4-in., 4 1.5-in. A.A.	3 21.7 -in.	220	650
Le Mallin	Ch. de France							Terrible did 45 knots on trial.			(T)		
L'Indomptable	Ch. Naval Français												
Le Triomphant *													
Le Terrible													
Vauquelin	Dunkerque	1932											
Kersaint	Nantes ..	1931											
Cassard	Nantes ..	1932	424½	39	14	2	2,441	64,000	36	{ 5 5.4-in., 4 1.5-in. A.A.	7 21.7 -in.	220	650
Tartu	Nantes ..	1931											
Le Chevalier-Paul	Havre.. .. .	1932											
Aigle	Dunkerque												
Vantour	Havre.. .. .												
Albatros	St. Nazaire	1930	423	40	14	2	2,441	64,000	36	{ 5 5.4-in., 4 1.5-in. A.A.	6 21.7 -in.	220	650
Gerfaut	Nantes ..												
Milan	Lorient ..	1930	423	40	14	2	2,441	68,000	37	{ 5 5.4-in., 4 1.5-in. A.A.	7 21.7 -in.	220	650
Epervier	Penhoet ..	1928											
Valmy	St. Nazaire	1928											
Verdun	Dunkerque	1930	427	39	15	2	2,436	64,000	36	{ 5 5.4-in., 4 1.5-in. A.A.	2 21.7 -in.	207	650
Vauban	Dunkerque	1929											
Lion	Lorient ..	1928											
Guépard	St. Nazaire..	1924											
Leopard *	St. Nazaire..	1925	416	37½	17½	2	2,126	55,000	35.5	5 5.1-in.	21.7 -in.	206	530
Lynx	Nantes ..	1924									(T)		
Tigre													
DESTROYERS—													
L'Aventurier	Bordeaux ..	Bldg.											
L'Opiniâtre	La Seyne ..												
L'Intépide	Loire												
Le Teméraire													
Le Hardi													
Mameluck	Loire												
Adroit ex-Epée	Gironde ..	1938	363½	36½	10½	2	1,772	58,000	37	6 5.1-in., 2 1.5-in.	7 21.7 -in.	..	..
Lansquenot													
Casque													
Le Foudroyant	La Seyne ..	1940											
ex-Fleuret													
Sirocco ex-Corsaire		1940											
Bison ex-Le Flibustier													
Forbin	Havre.. ..	1928											
Frondeur	Caen	1929											
Fougueux	Nantes ..	1928											
Basque	Maritime ..	1929											
Bordelais	Bordeaux ..	1928											
Boulonnais	Caen	1927	351.7	32.2	10.2	2	1,378	31,000	33	{ 4 5.1-in., 2 1.5-in. A.A.	2 21.7 -in.	146	300
Brestois	Nantes ..	1927											
L'Alcyon	Bordeaux ..												
Le Fortune	Caen	1926											
Le Mars	Caen												
La Palme	Nantes ..												
Mistral	Havre ..	1925											
Ouragon	Caen	1924											
Simoun	St. Nazaire..	1924											
Tempête	Nantes ..	1925											
Tramontane	Bordeaux ..	1924	347	33.0	13.9	2	1,319	33,000	33	{ 4 5.1-in., 2 1.5-in. A.A.	2 21.7 -in.	138	300
Trombe	Harfleur ..	1925											
Typhon	Bordeaux ..	1925											
Tornado	Bordeaux ..	1925											
L'Asile													
Le Fier													
L'Entrepreneur													
Le Farouche	Nantes ..	Bldg.	295½	30½	8½	2	994	28,000	34	4 3.9-in.	4		
L'Alsacien													
Le Corse													
Le Breton													

* Operated by the Free French.

France—continued.

Name or Number.	Where Built.	Launched.	Dimensions.			Number of Screws.	Displacement.	Horse-Power.	Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.
			Length. (Extreme.)	Beam.	Draught.								
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
TORPEDO BOATS—													
*La Melpomène	Nantes ..	1935	264·9	26·0	9·2	2	610	22,000	34·5	{ 2 3·9-in., 4 M. A.A. }	1 21·7-in. (1)	131	90
La Pomone.. ..													
La Flore													
L'Iphigénie ..													
Bombarde	Nantes ..	1936											
Bouclier	Le Trait ..	1937											
La Bayonnaise ..	Bordeaux ..	1936											
La Pourçulante ..	Dunkerque ..	1936											
La Cordelière ..	Normand ..	1936											
L'Incomprise ..	Le Trait ..	1937											
Baliste	Dunkerque ..	1937											

CRUISER SUBMARINES—													
*Surcouf	Cherbourg ..	1929	361	29·5	23½	2	Surf. Sub. 2880	Surf. Sub. 7600	Surf. Sub. 18	2 8-in.	14	150	..
1ST CLASS SUBMARINES													
La Martinique	Bdg.	325½	27½	14	2	1605	12,000	21	1 3·9-in.
Beveziers	Cherbourg ..	1935	302·8	27	16	2	1379	8000	18	1 3·9-in., 1	11	63	..
Sidi-Ferruch ..	Brest ..	1937					2060	2000	10	1·5-in. A.A.			
Casabianca	{ Ch. de la	1935											
	{ Loire ..	1935											
Le Glorieux	Cherbourg ..	1932	301·8	27	16	2	1379	8000	18	1 3·9-in., 1	11	61	96
Le Centaure	Cherbourg ..	1933					2060	2000	10	1·5-in. A.A.			
Le Héros	Brest ..	1933											
Le Conquerant ..	Brest ..	1932											
Le Tonnant	Loire ..	1934	302·5	27	16	2	1379	8000	17	1 3·9-in., 1	11	61	96
L'Espoir	Cherbourg ..	1931					2060	2000	10	1·5-in. A.A.			
Protée	La Seyne ..	1930											
Pégase	St. Nazaire	1929					1379	8000	17	1 3·9-in., 1			
Acheron	St. Nazaire	1929	302·5	27	16	2	2060	2000	10	1·5-in. A.A.	11	61	96
Argo	Nantes ..	1930											
Acteon .. ..	..	1930										
Pascal	Brest ..	1930											
Pasteur	1930	302·5	27	16	2	1379	8000	17	1 3·9-in., 1	11	61	96
Henri Poincaré ..	Lorient ..	1928					2060	2000	10	1·5-in. A.A.			
Archimède	Caen ..	1929											
Fresnel	St. Nazaire	1929											
Monge	La Seyne ..	1929	302·5	27	16	2	1384	8000	17	1 3·9-in. A.A.	11	63	96
Redoubtable	Cherbourg ..	1928					2080	2000	10	1·1-pr. A.A.			
Vengeur .. ..	..	1924										
Requin	Cherbourg ..	1925											
Morse	1925	257½	23	17½	2	974	2900	16	1 3·9-in. A.A.	10	54	..
Calman .. ..	..	1927					1415	1800	10			
Dauphin	Toulon ..	1926											
Espadon .. ..	..	1926										
Marsouin	1924	257½	23	17½	2					21·7
Phoque	Brest ..	1928											

* Operated by the Free French.

France—continued.

Number and Name	Where Built.	Launched.	Dimensions.			Number of Screws.	Displacement. Surf./Sub.	Horse-Power.	Speed. Surf./Sub.	Armament.	Torpedo Tubes.	Complement.	Fuel.
			Length. (Extreme.)	Beam.	Draught.								Coal Oil
2ND CLASS SUBMARINES													
L'Aurore	Toulon ..	1940	Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
La Creole	Havre ..	Bldg.	238·3	20·3	12·3	2	893 1170	3000 1400	14·5 9	1 3·9-in. 2·5 m.	9 21·7	44	..
La Bayadere .. .	Le Trait												
La Favorite .. .	Havre ..	Bldg.	238·3	20·3	12·3	2	893 1170	3000 1400	14·5 9	1 3·9-in. 2·5 m.	9 21·7	44	..
L'Africaine .. .													
L'Artemise .. .	Worms	Bldg.	238·3	20·3	12·3	2	893 1170	3000 1400	14·5 9	1 3·9-in. 2·5 m.	9 21·7	44	..
La Gorgone .. .													
L'Hermione .. .	Nantes	Bldg.	238·3	20·3	12·3	2	893 1170	3000 1400	14·5 9	1 3·9-in. 2·5 m.	9 21·7	44	..
L'Andromaque ..													
L'Armide .. .	Le Trait ..	Bldg.	223·5	18·3	11·3	2	600 800	1800 1120	14 9	1 3-in. 2 m.	9 21·7	48	..
L'Andromede ..													
L'Astree .. .	Worms	Bldg.	224	17½	13	2	597 800	1300 1230	14 9	1 3-in., 2 m.	9 21·7	..	..
La Clorinde ..													
L'Antigone ..	Dublgeon ..	Bldg.	224	17½	13	2	597 800	1300 1230	14 9	1 3-in., 2 m.	9 21·7	..	..
Ceres .. .													
Pallas .. .	Ch. Normand, Havre	1931	210	20	13	2	558-570 787	1300 1000	14 9	1 3-in., A. A.	6 21·7 2 15·7	43	..
Minerve .. .	Worms ..	1932											
Junon .. .	Ch. Normand	1932	216½	20	13	2	565-571 787	1300 1000	14 9·2	1 3-in. A. A.	6 21·7 2 15·7	43	..
Vénus .. .	Worms ..	1932											
Iris .. .	Le Trait ..	1932	216½	20	13	2	565-571 787	1300 1000	14 9·2	1 3-in. A. A.	6 21·7 2 15·7	43	..
Orphée .. .	Havre ..	1930											
Oréade .. .	Ch. Normand	1929	216·5	20	13	2	576 766	1200 1000	14 9	1 3-in. A. A.	7½ 21·7	40	..
Orion .. .	Worms ..	1929											
Ondine .. .	Schneider	1925	204·5	21	12·8	2	552 765	1250 1000	14 9	1 3-in. A. A.	7 21·7	40	..
La Psyché .. .	Le Trait ..	1927											
La Sybille .. .	Havre ..	1927	210	21	14½	2	548 744	1300 1000	14 9·5	1 3-in. A. A.	7 21·7	39	..
La Vestale .. .	St. Nazaire	1925											
La Sultane .. .	Toulon	1925	216·5	23·3	13·5	2	669 910	1300 800-1000	12 9	1 3-in., A. A.	5 21·7	40	..
Amphitrite .. .		1933											
Antiope .. .	Toulon	1933	216·5	23·3	13·5	2	669 910	1300 800-1000	12 9	1 3-in., 1 m., 32 mines	5 21·7	40	..
Atalante .. .		1930											
Amazon .. .	Toulon	1928	216·5	23·3	13·5	2	669 910	1300 800-1000	12 9	1 3-in., 1 m., 32 mines	5 21·7	40	..
Diane .. .		1928											
Méduse .. .	Toulon	1929	216·5	23·3	13·5	2	669 910	1300 800-1000	12 9	1 3-in., 1 m., 32 mines	5 21·7	40	..
Argonaute .. .		1929											
Aréthuse .. .	Toulon	1929	216·5	23·3	13·5	2	669 910	1300 800-1000	12 9	1 3-in., 1 m., 32 mines	5 21·7	40	..
Arlane .. .		1929											
Danaë .. .	Schneider	1925	216·5	23·3	13·5	2	576 766	1200 1000	14 9	1 3-in. A. A.	7½ 21·7	40	..
Eurydice .. .		1927											
Circé .. .	St. Nazaire	1925	210	21	14½	2	548 744	1300 1000	14 9·5	1 3-in. A. A.	7 21·7	39	..
Calypso .. .		1925											
Thétis .. .	Toulon	1925	216·5	23·3	13·5	2	669 910	1300 800-1000	12 9	1 3-in., 1 m., 32 mines	5 21·7	40	..
Naïde .. .		1925											
Sirène .. .	Toulon	1925	216·5	23·3	13·5	2	669 910	1300 800-1000	12 9	1 3-in., 1 m., 32 mines	5 21·7	40	..
Galatée .. .		1925											
MINELAYING SUBMARINES—													
Perle .. .	Toulon	1933	216·5	23·3	13·5	2	669 910	1300 800-1000	12 9	1 3-in., 1 m., 32 mines	5 21·7	40	..
Diamant .. .		1933											
*Rubis .. .	Toulon	1930	216·5	23·3	13·5	2	669 910	1300 800-1000	12 9	1 3-in., 1 m., 32 mines	5 21·7	40	..
Nautilus .. .		1928											
Saphir .. .	Toulon	1929	216·5	23·3	13·5	2	669 910	1300 800-1000	12 9	1 3-in., 1 m., 32 mines	5 21·7	40	..
Turquoise .. .		1929											
Emeraude .. .	Toulon ..	Bldg.	216·5	23·3	13·5	2	669 910	1300 800-1000	12 9	1 3-in., 1 m., 32 mines	5 21·7	40	..

French submarines are divided into two classes. 1st class: All vessels of 900 tons and above in the surface condition; 2nd class: All smaller vessels, including the minelayers.

• Operated by the Free French.

Germany.

Name or Number.	Where Built.	Launched.	Dimensions.			Number of Screws.	Displacement.	Horse-Power.	Designed Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.
			Length. (Extreme.)	Beam.	Draught.								Coal Oil
Tons.													
DESTROYERS—													
(Z 4) Richard Beitzen	Deutsche- Werke, Kiel	1935	374	37	9½	2	1625	40,000	36	5 5-in. 4 1½-in.	2 21 in. (Q)	252	..
(Z 5) Paul Jacobi ..													
(Z 6) Theodor Riedel													
(Z 7) Hermann Schoemann													
(Z 10) Hans Lody ..													
(Z 14) Friedrich Ihn													
(Z 15) Erich Steinbrinck	Blohm & Voss Hamburg	1938	385½	38½	9½	2	1811	50,000	36	5 5-in. 4 1½-in.	2 21 in. (Q)	280	..
(Z 16) Friedrich Eckoldt													
Z 20 Karl Galster	Deschimag, Bremen	1938	385½	38½	9½	2	1811	50,000	36	5 5-in. 4 1½-in.	2 21 in. (Q)	280	..
Z 23-30 Narvik Flotilla		1939											
*Itlis	Wilhelms- haven	1927	304	28½	8½	2	800	25,000	34	3 4½-in. 2 1-pr. A.A.	2 19½ in. (T.)	125	— 300
*Wolf		1927											
*Tiger		1928											
*Luchs		1928											
*Jaguar	Wilhelms- haven	1926	287½	27½	9½	2	800	24,000	33	3 4½-in. 2 1-pr. A.A.	2 19½ in. (T.)	120	— 300
*Leopard		1926											
*Seeadler		1926											
*Greif		1926											
*Kondor		1926											
*Falke		1926											
*Möwe	1926												
TORPEDO BOATS—													
T. 1-30 .. .. .	..	1938- 1940	267	28½	6½	2	600	25,000	36	1 4½-in. 1 1½-in.	2 21 in. (T)	..	..
SUBMARINES—†													
U 1-6	Deutsche Werke, Kiel	1935 | 1936	136½	13	12½	2	250	700	13 7	1 1-pr.	3 21 in.	23	..
U 7-11, 17, 20-24 ..														Germania Werft, Kiel
U 28-30	Deschimag, Bremen	1936	206½	19	13	..	500	..	16½ 8	1 3½-in. 1 1-pr.	5 21 in.	35	..
U 34 .. .. .														Germania Werft, Kiel
U 37, 38, 43	Deschimag, Bremen	1939	246	20½	13½	..	740	3200	18½ 9	1 4-in. 1 1-pr.	6 21 in.	40	..
U 45-55			Krupp Germania	213	19½	13½	2	517	2100	16½ 8	1 3½-in. 1 1-pr.	5 21 in.	35
U 56-63	Deutsche Werke, Kiel		136½	13	12½	2	250	700	13 7	1 1-pr.	3 21 in.	23	..
U 65-68	Deschimag, Bremen		246	20½	13½	2	740	3200	18½ 9	1 4-in. 1 1-pr.	6 21 in.	40	..
U 69-76	Krupp Germania		213	18½	13½	2	517	2100	16½ 8	1 3½-in. 1 1-pr.	5 21 in.	35	..
‡U 570													

* Classified as torpedo boats in German official lists.

† The strength of the German Submarine Fleet is not known.

‡ Captured by British Hudson Aircraft.

Greece.‡

Name or Number.	Where Built.	Launched.	Dimensions.			Number of Screws.	Displacement.	Horse-Power.	Maximum Trial Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel. Coal Oil			
			Length. (Extreme.)	Beam.	Draught.											
DESTROYERS—																
Hydra	Odero, Genoa	1931	Feet.	Feet.	Feet.		Tons.		Knots.				Tons.			
Conduriotis			308·8	30·3	10·5	2	1230	30,000	40	4 4·7 in., 4 2-pr. A.A. 40 mines	6 21-in. (T.)	156	630			
Spetsai			314·8	30·3	11·3	2	1308									
Psara																
Thyella	Yarrow ..	1906	220	20·6	9·0	2	305	6006	30	2 3-in.	2	70	80			
Sphendon										1 2-pr.	18-in.					
King Georges I. .. .	Yarrow	1938	320	33	8·5	2	1350	34,000	36	4 5-in., 4 1·5-in.	8 21-in.	150	455			
Queen Olga																
Niki	Stettin	1906	220	20·6	9·0	2	275	6000	30	2 3-in., 4 6-pr.	2 21-in.	70	90			
Aspis																
*Aetos, *Leon, .. .	Birkenhead	1911	293	27·7	9·6	2	1013	19,750	32	4 4-in., 2 2-pr.	6 21-in.	102	260			
*Panther, *Ierax ..											(Panther and Aetos, 40 mines)	(T.)				
TORPEDO BOATS—																
Arethousa	Stettin (Vulcan)	1913	147·8	9	4	2	142	2400	25	2 6-pr.	3 18-in.	..	25			
Doris																
Aigli																
Alkyoni	Fiume	1914	178·4	18·8	5	2	237	5000	28½	1 11-pr.	2 18-in.	25	21 31			
† Pergamos																
† Proussa																
† Kios	Monfalcone	1927	226½	18½	12·6	2	689	1500	14	1 4-in., 1 2-pr. A.A.	6 21-in.	30	..			
† Kyzikos																
† Kydonia																
SUBMARINES—																
Katsonis	Schneiders, Harfleur	1926	203½	17·7	12·3	2	567	1300	14	1 4-in., 1	6	30	..			
Papanicolis	Ch. de la Loire, Nantes						760	1000	9·5	2-pr. A.A.	21-in.					
Nereus	Ch. de la Loire, Nantes	1927	226½	18½	12·6	2	689	1500	14	1 4-in., 1	8	42	..			
Triton	Nantes	1928								945	1200	9·5	2-pr. A.A.	21-in.		
Glaucos	Ch. de France, Caen	1928														

* Reconstructed by Messrs. J. S. White & Co., Cowes, 1924-25.

† Surrendered Austrian torpedo-boats.

‡ Under the control of Germany. Some of the above vessels are under British control.

Italy.

Name or Number.	Where built.	Launched.	Dimensions.			Number of Screws.	Displacement.	Horse-Power.	Maximum Trial Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.
			Length. (Extreme.)	Beam.	Draught.									Oil
DESTROYERS—													
U. Vivaldi	Genoa	1929	353	33·6	10·5	2	1628	50,000	38	6 4·7-in. (In pairs) 4 1·5-in. A.A. Carry mines	2 21-in. (D.)	185	600
A. Usodimare	(Odero)	1929											
L. Tarigo	Genoa	1928											
L. Malocello	(Ansaldo)	1929											
L. Pancaldo	Riva Trigoso	1929											
A. Da Noli	(Cant. Navali)	1929											
E. Pessagno	Ancona	1929											
N. Da Recco	(Cant. Navali)	1929											
N. Zeno		1928											
G. Da Verazzano ..	Fiume ..	1928											
A. Pigafetta		1929											
Augusto Riboty ..	Ansaldo ..	{1915}	340	32	9·8	2	1382	35,000	35	{ 8 4-in., 4 2-pr. A.A., 100 mines.}	2 18-in. (D.)	150	344
Carlo Mirabello ..		{1914}											
Camicia Nera ..	Odero-Terni Orlando	1938	350	33·4	10·9	2	1620	48,000	39	4 4·7-in. 4 1·5-in. A.A.	6 21-in.	170	..
Aucari													
Corazziere													
Geniere													
Aviere													

Italy—continued.

Name or Number.	Where Built.	Launched.	Dimensions.			Number of Screws.	Standard Displacement.	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.											
			Length. (Extreme.)	Beam.	Draught.									Oil										
DESTROYERS—Contd.																								
Carabiniere	Cartieri Dell' Tirreno	1938	350	33·4	10·9	2	1620	48,000	39	4 4·7-in.	6	170	..											
Lanciere										Riva Trigoso	4 1·5-in. A.A.			21-in.										
Granatiere										Cartieri	4 4·7-in.			6										
Bersagliere	Navali Rivotti	1938	350	33·4	10·9	2	1620	48,000	39	4 1·5-in. A.A.	21-in.	170	..											
Fuciliere	Palerino	1938	350	33·4	10·9	2	1620	48,000	39	4 4·7-in.	6	..	..									
Alpino	Cartieri									4 1·5-in. A.A.	21-in.													
*Lira	Navali di Ancona									4 4·7-in.	6													
*Lupo	Cartiere	1937	267	26	7·9	2	679	19,000	34	4 1·5-in. A.A.	21-in.	94	..											
*Lince	Naval del									3 3·9-in.	4													
*Libra	Quarnaro									6 1·5-in.	18-in.													
*Cllo	Fiume	1937	267	26	7·9	2	679	19,000	34	3 3·9-in.	4	94	..											
*Calliope	Ansaldo,	6 1·5-in.								18-in.														
*Calipso	Genoa	4 4·7-in.								6														
*Circe	Ansaldo,	1938								4 1·5-in. A.A. carry mines	21-in.													
*Alcione										Genoa	3 3·9-in.			4										
*Aretusa	Naples ..	1937								6 1·5-in. A.A.	18-in.													
*Polluce										6 1·5-in. A.A.	18-in.													
*Partenope	Orlando.	1936								343	33½			10	2	1498	48,000	39	3 3·9-in.	4		
*Plefadi																			4 1·5-in. A.A. carry mines	21-in.				
*Pallade	Ansaldo	1936								267	27			7·6	2	652	19,000	34	4 4·7-in.	6	156	600		
L. Oriani	Ancona		3 3·9-in.	4																				
V. Alfieri	Flume	1935	269	27	7·2	2	652	19,000	34	6 1·5-in. A.A.	18-in.	..	..									
Aldebaran	Ancona									3 3·9-in.	4													
Andromeda	Ancona	1934	350	33½	10	2	1449	44,000	38	4 4·7-in.	6	156	600											
Antares	Genoa									4 1·5-in. A.A.	21-in.													
*Canope	Odero, Sestri	1930	315	32	9·5	2	1206	44,000	38	4 4·7-in. 4 M. A.A. 21·5-in. A.A.	6 (T.)	156	225											
*Cassiopea														Pozente										
*Castore	Cant. Navale	4 4·7-in.												6										
*Cigno	di Tirreno,	4 M. A.A.												21-in.										
*Sagittario	Sestri Levante	21·5-in. A.A.												(T.)										
*Centaurio	Cartieri	4 4·7-in.												6										
*Climene	Partenopei,	4 M. A.A.												21-in.										
Sirio	Naples	4 4·7-in.												6										
Perseo	Genoa	1927												307½	30	9·5	2	1073 1092	35,000	36	3 M., 52 mines	21-in.	140	340
Grecule																					2 1·5-in.	(T.)		
Maestrale	Naples (Pattison)	{1925 1925}												278·6	28·2	8·6	2	935	36,000	35	4 4·7-in.	6	106	200
Scirocco																					22-pr. A.A.	21-in.		
Dardo	Naples (Pattison)	{1916 1916}												237½	24	9·0	2	669	15,000	32-33·8	4 4·7-in.	6	100	150
Strale																					2 M., 40 mines	4		
Freccia	Genoa (Odero)	{1918 1917}												237½	24	7·9	2	635	15,500	31-34	4 4-in., 2	4	100	150
Saetta																					3-in., 2 M.	18-in.		
Folgore	Genoa (Odero)	{1917 1917}												237½	24	7·9	2	635	15,500	31-34	10 mines.	(D.)	100	150
Lampo																								
Turbine	Genoa (Odero)	{1917 1917}												237½	24	7·9	2	635	15,500	31-34	4 4-in., 2	4	100	150
Euro																					3-in., 2 M.	18-in.		
Francesco Crispi ..	Naples (Pattison)	{1925 1925}	278·6	28·2	8·6	2	935	36,000	35	4 4·7-in.	6	106	200											
Quintino Sella ..										22-pr. A.A.	21-in.													
*Giuseppe Sirtori ..	Naples (Pattison)	{1916 1916}	237½	24	9·0	2	669	15,000	32-33·8	4 4·7-in.	6	100	150											
*Francesco Stocco ..										2 M., 40 mines	4													
E. Cosenz	Genoa (Odero)	{1918 1917}	237½	24	7·9	2	635	15,500	31-34	4 4-in., 2	4	100	150											
Giacomo Medici ..										3-in., 2 M.	18-in.													
G. La Farina	Genoa (Odero)	{1918 1917}	237½	24	7·9	2	635	15,500	31-34	10 mines.	(D.)	100	150											
Nicola Fabrizi ..																								
Angelo Bassini ..	Genoa (Odero)	{1917 1917}	237½	24	7·9	2	635	15,500	31-34	4 4-in., 2	4	100	150											
Giacinto Carini ..										3-in., 2 M.	18-in.													
G. La Masa	Genoa (Odero)	{1917 1917}																						

* Designated torpedo boats in Italian official lists.

Italy—continued.

Name or Number.	Where Built.	Launched.	Dimensions.			Number of Screws.	Standard Displacement	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.
			Length. (Extreme.)	Beam.	Draught.								Oil
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
DESTROYERS—contd.													
Fratelli Ceiroli ..	Naples (Pattison) Genoa (Odero)	1914	239	24	8·8	2	615	14,500	30	{ 5 4-in., 2 2-pr. A.A. 2 M.	{ 4 18-in. (D.)	71	150
Antonio Mosto ..													
Giuseppe Abba ..													
Rosalino Pilo ..													
*Simone Schiaffino ..	Genoa (Odero)	1914	236	24	8·8	2	615	13,500	30	{ 5 4-in., 2 2-pr. A.A. 2 M.	{ 4 18-in.	71	150
*Giuseppe Dezza ..		1914											
*Giuseppe Misori ..		1915											
*Gen. A. Cantore ..		1921	241½	24	7·9	2	635	18,000	30	{ 3 4-in., 23-in. A.A. 2 M.	{ 4 18-in. (D.)	100	150
*Gen. A. Chinotto ..													
*Gen. A. Papa ..													
*Gen. A. Cascino ..													
*Gen. M. Prestinari ..													
*Gen. C. Montanari ..	1922												
Audace (ex-Japanese Kawakaze) ..	Yarrow ..	1917	287	27·5	8·3	2	628	21,500	34·5	{ 7 4-in., 2 M.	{ 4 18-in. (D.)	{ 111	252
Solferino ..	{ Leghorn (Orlando)	1921	269	26·5	8·6	2	{ 860 966	22,000	32	{ 4 4-in., 2 3-in. A.A., 2 M., 24 mines	{ 6 18-in.	105	170
S. Martino, Curtatone ..		1922											
Castelfidardo, Calatafimi, Monzambano ..		1923											
TORPEDO BOAT—													
†Albatros ..	Orlando ..	1934	231½	22½	6	2	340	4,000	24·5	{ 2 4-in. 4 1·46-in.	{ 2 17·7-in.
SUBMARINES—													
Saint Bon ..	Monfalcone	1940	285	25·5	17·2	2	1461	4600	18 8·9	{ 2 3·9-in., 4 M. A.A.	{ 14 18-in.
Cagni ..													
Millo ..													
M. Bianchi ..													
L. Torelli ..	La Spezia ..	1939	247	22·5	15·5	2	1036	3600	18 8·5	{ 1 3·9-in., 4 M. A.A.	{ 8 21-in.	60	..
A. Malaspina ..		1940											
M. F. Baracca ..		1940											
G. Marconi ..		1939											
L. da Vinci ..	Taranto ..	1939	250	23	13·8	2	1030	3500	18 8·5	{ 1 3·9-in., 4 M. A.A.	{ 8 21-in.	60	..
A. Bagnolini ..		1940											
R. Giuliani ..		1939											
Barbarigo ..		1938											
Veniero ..	Adriatico ..	1938	239½	23·5	15·5	2	941	3,000	17 8·5	{ 2 3·9-in. 2 M. A.A.	{ 8 21-in.
Dandolo ..		1938											
Morosini ..		1937											
Mocenigo ..		1938											
Emo ..	Tosi ..	1937	231·4	22½	13½	2	896	3,000	17 8·5	{ 1 3·9-in. 4 A.A.	{ 8 21-in.
Brin ..		1938											
Guglielmotti ..	Spexia ..	1938	238	23·5	15	2	950	3,000	17 8·5	{ 2 3·9-in., 4 M.	{ 8 21-in.
Cappellini ..		1939											
Adua ..	Adriatico ..	1936	19	21	14·4	2	620	1350	14 8·5	{ 1 3·9-in. 2 M.	{ 6 21-in.	40	..
Alagi ..		1936											
Aradam ..	Orlando ..	1936											
Ascianghi ..		1937											
Azum ..	Adriatico ..	1936											
Dagabue ..		1936											
Dessle ..	Tosi ..	1936											
Uarshefch ..	Tosi ..	1937											
Scire ..	Orlando ..	1938											
Tembien ..		1938											
Beilul ..		1938											

* Designated torpedo boats in Italian official lists.

‡ Submarine chaser.

Italy—continued.

Name or Number.	Where Built.	Launched.	Dimensions.			Number of Screws.	Standard Displacement.	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.
			Length. (Extreme.)	Beam.	Draught.								
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
SUBMARINES—contd.													
Argo	Adriatico ..	1936	206	22·6	10·5	2	676	1350	14	1 3·9-in.	6		
Velella							901	800	8	2 M.G.	21-in.	40	..
Perla							620	1350	14	1 3·9-in.	6		
Diaspro	Adriatico ..	1936	197	21	14·4	2	844	800	8·5	2 M.	21-in.	40	..
Turchese													
Corallo													
Malachite	Orlando ..	1936	197	21	14·4	2	620	1350	14	1 3·9-in.	6		
Ambra							844	800	8·5	2 M.	21-in.	40	..
Onice													
Atropo †	Tosl	1937	266½	23½	12½	2	1190	2880	17	1 3·9-in.	6		
Zoea †							1550	1300	8	2 M.	21-in.	60	..
Calvi †							1332	4400	17	30 mines	21-in.	60	..
Finzi †	Spezia ..	1935	275	25·5	13·2	2	1985	1800	8·75	2 4·7-in. 4 M.	8		
Tazzoli †										14 mines	21-in.	60	..
Smeraldo													
Topazio	Orlando ..	1933	197	21	12	2	590	1,350	14	1 3·9-in.	6		
Zaffiro & Ameotista							787	800	8·4	2 M.	21-in.	..	..
Sirena, Nereide,													
Galatea	Monfalcone												
Ondina	Taranto ..	1934	231½	22½	13	2	800	3,000	17	1 3·9-in.	8		
Archimede, Ferraris							1231	1,300	8·5	2 M.	21-in.	..	..
							860	3,000	17·0	2 3·9-in.	8		
Otaria †	Monfalcone	1934	240	23½	14½	2	1167	1,040	8·5	2 M.	21-in.	..	..
Pietro Micca † ..	Taranto ..	1935	296	25½	17·5	2	1371	3,000	15·5	2 4·7-in.	6		
Squalo, Narvalo,	Cantiere N.,	1930	229	19	14·5	2	1883	1,500	8·5	4 M.	21-in.	..	..
Delfino, Tricheco							810	3,000	16·5	40 mines	8		
Fisali & Medusa							1077	1,400	9	1 4-in.	21-in.	64	..
Jalea & Jantina ..	Cantiere N.,	1931	201·8	18·5	13	2	599	1,200	14	2 M.	21-in.	..	..
Serpente & Salpa ..							778	800	8·5	1 4-in.	21-in.	..	..
Santorre Santarosa													
Ciro Menotti	Ansaldo ..	1929	229	19	15·5	2	815	3,000	17·5	1 4-in.	8		
Fratelli Bandiera ..							1078	1,300	9	2 M.	21-in.	50	..
Luciano Manara ..							797	3,000					
Luigi Settembrini ..	Taranto ..	1930	233	18·6	14	2	1134	1,400	19	1 4·7-in.	8		
Ruggiero Settimo ..							1340	5,500	10	4 M.	21-in.	66	80
E. Fieramosca ..							1760	2,000	14	1 4-in., 2 M.	4		
M. Bragadino	Spezia,	1927	287	25·6	13·5	2	1051	1,000	8	24 mines	21 in.	50	41
F. Corridoni							1368	4,400	18·5	1 4·7-in.	6		
Ballila †							1874	2,200	9	4 M. 16 mines	21-in.	66	140
A. Sciesa †	Ansaldo	1927	223	18·7	13·8	2	791	3,000	17·5	1 4-in.	6		
E. Toti †							1040	1,000	9	2 M.	21-in.	35	48
D. Millesire † ..													
V. Pisani	Montfalcone,	1928	212	21·5	13	2	770	3,000	17	1 4-in.	6		
M. Colonna							994	1,000	9	2 M.	21-in.	35	48
Da. Geneys													
G. Bausan	Trieste	1928	212	21·5	13	2	390	650	8	1 3 in. A.A.	2		
G. Mameli							460	360	6	1 M., 18	2		
T. Speri							336	620	13	1 3-in. A.A.	4		
G. Da. Procida ..	Taranto ..	1928					466	480	10	1 M., H1, 4,	4		
										and 6 only	18-in.	22	18

† Minelayers.

About 14 submarines projected.

Japan.

Name or Number.	Where Built.	Launched.	Dimensions.			Number of Screws.	Displacement.	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Compliment.	Fuel.
			Length (Extreme.)	Beam.	Draught.								Oil
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons
DESTROYERS:													
FIRST CLASS—													
Tanikase	Fujinagata..	1939- 1940	360	33·3	9	2	1500- 2000	38,000	34	6 5-in.	2 21-in. (Q.)	..	
Amatsukaze	Maizuru ..												
Tokitsukaze	Uraga.. ..												
Arashi	Maizuru ..												
Urakaze	Fujinagata ..												
Hagikaze	Uraga.. ..												
Nowake	Maizuru ..												
Yukikaze	Sasebo ..												
Kuroshio	Fujinagata ..												
Oyashio	Maizuru ..												
Natsushio	Fujinagata ..	1937- 1938	356	33·3	9	2	1500	38,000	34	6 5-in.	2 24-in. (Q.)	200	..
Hatsukaze	Kawasaki ..												
Hayashio	Uraga ..												
Arashio	Kawasaki ..												
Osio	Maizuru ..												
Michishio	Fujinagata ..												
Asagumo	Kawasaki ..												
Minegumo	Fujinagata ..												
Kasumi	Uraga ..												
Yamagumo	Fujinagata ..												
Natsagumo	Sasebo ..	1935- 1936	336	31·8	9·1	2	1368	37,000	34	5 5-in. 2 M.G.	2 21-in. (Q.)	200	400
Asashio	Maizuru ..												
Arare	Maizuru ..												
Kagero	Maizuru ..												
Shiranuhi	Uraga ..												
Isokaze	Sasebo ..												
Yudachi	Sasebo ..												
Harusame	Maizuru ..												
Samidare	Uraga ..												
Umikaze	Maizuru ..												
Yamakaze	Uraga ..	1933- 1934	338	32·7	8·8	2	1368	37,000	34	5 5-in. guns 2 M.	2 21-in. (T.)	200	400
Kawakaze	Sasebo ..												
Suzukaze	Uraga ..												
Murasame	Sasebo ..												
Shigure	Uraga ..												
Shiratsuyu	Sasebo ..												
Hatsushima	Uraga ..												
Ariake	Kawasaki ..												
Yugure	Maizuru ..												
Wakaba	Sasebo ..												
Nenohi	Uraga ..	1929- 1932	371·5	34	10·7	2	1700	40,000	34	6 5-in., 2 M.	3 21-in. (T.)	200	420
Hatsuhara	Sasebo ..												
Oboro	Sasebo ..												
Akebono	Fujinagata ..												
Sazanami	Maizuru ..												
Ushio	Uraga ..												
Akatsuki	Sasebo ..												
Hibiki	Maizuru ..												
Ikazuchi	Uraga ..												
Inazuma	Fujinagata ..												
Sagiri	Uraga ..	1929 1929 1930 1930 1929 1929 1927 1928 1928 1927	371·5	34	10·7	2	1700	40,000	34	6 5-in., 2 M.	3 21-in. (T.)	197	420
Asagiri	Sasebo ..												
Yugiri	Maizuru ..												
Amagiri	Tokyo ..												
Shikidami	Maizuru ..												
Ayanami	Fujinagata ..												
Fubuki	Maizuru ..												
Shirayuki	Yokosuka ..												
Hatsuyuki	Maizuru ..												
Murakumo	Fujinagata ..												
Shinonome	Sasebo ..												
Usugumo	Ishikawa- jima (Tokyo)	1927 1927 1927 1928											
Shirakumo	Fujinagata ..												
Isonami	Uraga ..												
Uranami	Sasebo ..												

Japan—continued.

Name or Number.	Where Built.	Launched.	Dimensions.			Number of Screws.	Displacement.	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.											
			Length (extreme).	Beam.	Draught.								Coal Oil											
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons											
DESTROYERS—contd.																								
FIRST CLASS—contd.																								
Minadzuki	Uraga	1926	320 b.p.	30	9·8	2	1315	38,500	34	{ 4 4·7-in., 2 M. A.A. }	2 21-in. (T)	148	— 400											
Fumitsuki	Fujinagata ..	1926																						
Nagatsuki	Ishikawajima ..	1926																						
Kikudzuki	Maizuru	1926																						
Mikadzuki	Sasebo	1926																						
Mochidzuki	Uraga	1927																						
Yudzuki	Fujinagata ..	1927																						
Yayoi	Uraga	1924, 25																						
Udzuki	Ishikawajima ..	1925																						
Mutsuki	Sasebo	1924, 25																						
Kisaragi	Maizuru	1925	320 b.p.	30	9·6	2	1270	38,500	34	{ 4 4·7-in., 2 M. A.A. }	3 21-in. (D)	148	— 400											
Satsuki	Fujinagata ..	1925																						
Oite	Uraga	1924, 25																						
Hayate	Ishikawajima ..	1925																						
Yunagi	Sasebo	1924, 25																						
Kamikaze	Nagasaki	1922																						
Asakaze	Maidzuru ..	1922-24																						
Harukaze																								
Matsukaze	Fujinagata ..	1924																						
Hatakaze																								
Asanagi	Fujinagata ..	1924	320 b.p.	29·25	9·5	2	1215	38,500	34	{ 4 4·7-in., 2 M. A.A. }	3 21-in. (D)	149	— 400											
Sawakaze	Nagasaki ..	1919-22																						
Okikaze, Shimakaze, Nadakaze, Yukaze, Hakaze, Minekaze, Namikaze, Numakaze, Nokaze, Tashikaze, Shiohaze, Hokaze, Yakaze, Akikaze																								
SECOND CLASS—																								
Wakatake	Kawasaki, Kobe	1922	275 b.p.	26·5	8·3	2	820	21,500	31·5	{ 3 4·7-in., 2 M. A.A. }	2 21-in. (D)	110	— 250											
Kuretake																								
Fuyo	Fujinagata ..	1922, 23	275 b.p.	26·5	8·3	2	820	21,500	31·5	{ 3 4·7-in., 2 M. A.A. }	2 21-in. (D)	110	— 250											
Karukaya																								
Asagao	Ishikawa ..	1922-23	275·0 b.p.	25·3	7·9	2	755	16,000	31·5	{ 3 4·7 in., 2 M. }	2 18-in. (T)	109	92 212											
Yugao	jima																							
Sanaye	Uraga	1923	275·0 b.p.	26	8	2	770	21,500	31·5	{ 3 4·7 in., 2 M. A.A. }	2 21-in. (D)	80	— 290											
Yanagi, Momo ..	Sasebo	1916-18																						
Hinoki	Maizuru																							
Kaki	Kawasaki ..	1917-19	275·5 b.p.	26	8	2	770	21,500	31·5	{ 3 4·7 in., 2 M. A.A. }	2 21-in. (D)	80	— 290											
Kuri	Ishikawa ..																							
Nire, Tsuga	jima	1920-1922	275·5 p.p.	26	8	2	770	21,500	31·5	{ 3 4·7 in., 2 M., A.A. }	2 21-in. (D)	80	— 290											
Hagi	Uraga																							
Susuki, Yomogi ..	Ishikawa ..	1920-1922	275·5 p.p.	26	8	2	770	21,500	31·5	{ 3 4·7 in., 2 M., A.A. }	2 21-in. (D)	80	— 290											
Sumire	jima																							
Hishi, Hasu	Uraga	1920-1922	275·5 p.p.	26	8	2	770	21,500	31·5	{ 3 4·7 in., 2 M., A.A. }	2 21-in. (D)	80	— 290											
Tade, Fuji	Fujinagata ..																							
Aoi, Kiku	Kawasaki	1920-1922	275·5 p.p.	26	8	2	770	21,500	31·5	{ 3 4·7 in., 2 M., A.A. }	2 21-in. (D)	80	— 290											
Tsuta, Ashi, ..																								
TORPEDO BOATS—																								
Chidori	Maizuru ..	1933	254	24	6	2	527	7000	26	3 4·7 in.	2 21-in.	..	..									
Manazuru	Fujinagata ..																							
*Tomazuru	Maizuru ..	1933	254	24	6	2	527	7000	26	3 4·7 in.	2 21-in.	..	..									
Hatsukari	Fujinagata ..																							
†Yamasei	Schichau ..	1912	196	21	9	2	390		20	2 3-in.	..	..	..								
‡Kawasemi	Kawasaki ..	1908	135	15½	7·2	1	96	1200	23	{ 1 1·85-in., 1 1·6-in. }	3 14-in.	41	18 —											
Otori	Maizuru ..	1935	263	26	6½	2	595	9000	28	3 4·7-in. 1 M.G.	3 21 in.	..	..									
Hiyodori	Ishikawa ..																							
Hayabusa	jima	1935	263	26	6½	2	595	9000	28	3 4·7-in. 1 M.G.	3 21 in.	..	..									
Kasasagi	Yokohama ..																							
Kari	Osaka	1935	263	26	6½	2	595	9000	28	3 4·7-in. 1 M.G.	3 21 in.	..	..									
Sagi	Mitsubishi ..																							
Hato	Harima	1935	263	26	6½	2	595	9000	28	3 4·7-in. 1 M.G.	3 21 in.	..	..									
	Ishikawa ..																							
Kiji	jima	1935	263	26	6½	2	595	9000	28	3 4·7-in. 1 M.G.	3 21 in.	..	..									
	Mitsui																							
	Tama																							

Japan—continued.

Name or Number.	Where Built.	Launched.	Dimensions.			Number of Screws.	Displacement.	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes Complement.	Fuel Coal Oil
			Length (extreme).	Beam.	Draught.							
			Feet.	Feet.	Feet.		Tons.		Knots.			Tons.
SUBMARINES—												
168	Kure	1933	331	27	13	3	Surf. 1400	6000	20	1 3-9 in.	21-in.	60
169	Kobe	1934					Sub.					
170	Sasebo .. .	1934					1400					
171	Kawasaki ..	1935					—					
172 and 173 ..	Mitsubishi ..	1935	331	27	13	3	1400	6000	20	1 4-7 in.	21-in.	60
174 and 175 ..	Sasebo .. .	1936										
176 and 177 ..	Mitsubishi ..	1936	331	27	13	3	1400	6000	20	1 4-7 in.	21-in.	60
178 and 179 ..	Sasebo .. .	1936										
180-184 .. ..	.. .. .	1939	344	29-9	14-4	2	1950	6000	17	2 5-5 in.	21-in.	60
125-134 .. ..	.. .. .	1940					2600					
18	Kawasaki ..	1935	344	29-9	14-4	2	1950	6000	17	2 5-5 in.	21-in.	60
17	Kure	1935					2600					
16	Kawasaki ..	1934	320	30	15-7	2	1900	6000	17	1 5-in.	21-in.	60
15	Kure	1934					2500					
165	Kure	1931	321	26-9	15-9	2	1638	6000	19	1 4-in.	21-in.	70
166	Sasebo .. .	1931					2100					
167	Kobe	1928	320½	25-7	16	2	1635	6000	21	1 4-7 in.	21-in.	56
168	Kobe	1928					2100					
169	Kure	1929	320	30-2	15-7	2	1955	6000	17	{ 2 5-5 in. }	21-in.	61
170	Kure	1929					2480					
171	Kawasaki ..	1926	278½	24-6	14	2	1142	2400	14	1 5-5 in.	21-in.	45
172	Kure	1928					1470					
173	Kure	1927	331½	26	16	2	1635	6000	21	1 4-7 in.	21-in.	56
174	Kure	1927					2100					
175	Kure	1929	331½	26	16	2	1635	6000	21	1 4-7 in.	21-in.	56
176	Kure	1929					2100					
177	Sasebo .. .	1928	331½	26	16	2	1635	6000	21	1 4-7 in.	21-in.	56
178	Sasebo .. .	1928					2100					
179	Sasebo .. .	1929	331½	26	16	2	1635	6000	21	1 4-7 in.	21-in.	56
180	Sasebo .. .	1929					2100					
181	Yokosuka ..	1928	331½	26	16	2	1635	6000	21	1 4-7 in.	21-in.	56
182	Yokosuka ..	1928					2100					
183	Kure	1929	331½	26	16	2	1635	6000	21	1 4-7 in.	21-in.	56
184	Kure	1929					2100					
Ro. 33	Kure	1934	239½	22	10-5	2	700	1200	16	1 3-15 in.	21-in.	43
Ro. 34	Mitsubishi ..	1935					655					
Ro. 31	Mitsubishi ..	1927	243½	26	12-4	2	655	1200	13	1 4-7 in.	21-in.	43
Ro. 35	Mitsubishi ..	1926					1000					
Ro. 36	Mitsubishi ..	1927	250	24-2	12-4	2	988	2400	16	1 3-15 in.	21-in.	47
Ro. 37	Mitsubishi ..	1927					1300					
Ro. 38	Mitsubishi ..	1926	250	24-2	12-4	2	988	2400	16	1 3-15 in.	21-in.	47
Ro. 39	Mitsubishi ..	1926					1300					
Ro. 40	Mitsubishi ..	1924	300	28-7	15	2	1390	6000	19	1 4-7 in.	21-in.	60
Ro. 41	Mitsubishi ..	1923					2000					
Ro. 42	Kure	1924	243-5	20	12-4	2	655	1200	13	1 4-7 in.	21-in.	43
Ro. 43	Kure	1923					1000					
Ro. 44	Sasebo .. .	1923	243-5	20-1	12	2	746	2600	16	1 3-15 in.	21-in.	45
Ro. 45	Yokosuka ..	1924					1000					
Ro. 46	Sasebo .. .	1922	250	23-5	13	2	889	2400	17	1 3-15 in.	21-in.	45
Ro. 47	Kure	1923					1082					
Ro. 48	Yokosuka ..	1922	231-5	23-5	13	2	893	2400	17	1 3-15 in.	18-in.	65
Ro. 49	Mitsubishi ..	1922					1082					
Ro. 50	Mitsubishi ..	1921	231-5	23-5	13	2	893	2400	17	1 3-15 in.	18-in.	65
Ro. 51	Mitsubishi ..	1920					1082					

† Fitted for minelaying.

Netherlands.

Name or Number.	Where built.	Launched.	Dimensions.			Number of Screws.	Displacement.	Horse-power.	Maximum speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.	
			Length. (Extreme.)	Beam.	Draught.								Coal	Oil
			Feet.	Feet.	Feet.		Tons.		Knots				Tons	
DESTROYERS—														
*Banckert ..	Burgerhout	1929								4 4·7-in., 1 3-in. A.A., 4 1-pr., 4 M. 1 seaplane	6		—	
*Van Nes ..	Rotterdam	1930	321·5	31	9·8	2	1316	31,000	34	24 mines	21-in.	126	—	300
*Witte de With	Rotterdam	1928								4 4·7-in. 2 3-in. A.A. 24 mines	6		—	
Van Ghent	Flushing	1926								1 seaplane	21-in.	126	—	300
*Everaen ..	Rotterdam	1926	321·5	31	9·8	2	1316	31,000	34	24 mines	8		—	
*Piet Hein ..		1927								5 4·7-in., 4 1·5-in., 4 M., 1 seaplane, 24 mines.	21-in.	150	Oil	
*Kortenaar		1927												
Isaac Sweers	Scheldt	1940	348·8	33·8	11·5	2	1628	45,000	36					
Jan van Galen	Projected													
1ST CLASS TOR- PEDO BOATS—														
G 13, 15 and 16 ..	(Scheldt Fijenoord)	1913- 1914	162·5	17·3	9·0	1	150	2,600	25	2 3-in.	3 17·7-in.	27	40	—
Z 3 ..	Amsterdam	1917	201	20·4	6	2	277	5,500	27	2 3-in., 2 M.	4 17·7-in.	48	61 8	
Z 5-8 ..	(Scheldt Fijenoord)	1915	192	19·8	5·5	2	264	5,500	27	2 3-in., 2 M.	4 17·7-in.	48	70 7	
SUBMARINES—														
K XIV ..	Rotterdam	1932-3	242	21·5	12·5	2	Surf. 770	3,200	17	1 3·5-in., 2 2-pr.	8 21-in.	35	..	
K XV ..							1,030	1,000	9		4 21-in.			
K XVI ..	Fijenoord						966	5,000	17	1 3·5-in., 2 1·5-in.	8 21-in.	36	..	
K XVII ..							1,020	—	9					
K XVIII ..	Rotterdam	Bldg.	265	24·6	12·5	2								
O 19 ..														
O 20 ..														
O XXI ..	De Schelde	1939	254½	25½	13	2								
O 23 ..	Rotterdam	1939					888	5,000	20	1 3·5-in. 2 1·5-in.	8 21-in.	37	Oil	
O 24 ..		1940					1,205	—	9					
O 25 ..	Rotterdam	1940												
O 26 ..	Wilton Fijenoord	Bldg.												
O 27 ..		Bldg.												
O 14 ..	De Schelde	1931	199	18·7	11·5	2	560	1,900	15	2 1·5-in. A.A.	5 21-in.	31	..	
O 15 ..							700	600	8		6 17·7-in.			
K XIII ..	Fijenoord	1924	218·8	20·2	12·2	2	660	2,400	15	1 3·5-in. 1 maxim	4 17·7-in.	31	45	—
K XII ..							810	725	8					
K XI ..	Amsterdam Flushing	1925	179½	18·7	11½	2	506	900	12½	1 22-pr. A.A., 1 maxim	5 21-in.	29	21	—
O 10 ..							627	—	9					
O 9 ..														
K X ..	De Schelde	1923	210	18·3	11·9	2		1,550						
K IX ..		1922					560	630	15	1 3·5-in. 1 maxim	4 17·7-in.	31	45	—
K VIII ..		1922					690	1,800	8					
K VII ..	Fijenoord	1921	177·2	16·8	12·5	2	550	1,200	15	1 3-in., 1 maxim	6 17·7-in.	31	76	—

* Dutch East Indian Fleet.

A Netherlands Submarine operating with the British Navy reported lost.

Norway.

Name or Number.	Where Built.	Launched.	Dimensions.			Number of Screws.	Displacement.	Horse-Power.	Maximum Trial Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.	
			Length. (Extreme)	Beam.	Draught.								Coal	Oil
DESTROYERS—			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.	
2 Destroyers	Horten ..	Bldg.	319	32.9	8.9	2	1220	30,000	34	4 4.7-in. 2 1.57-in.	4 21	120	..	..
Draug, Troll	Horten ..	1908-13	226	22.5	8.8	2	540	7,500	27.0	6 3-in. Draug has 6 4.7-in. in addition	3 18 -in.	71	95 8	8
TORPEDO BOATS:														
FIRST CLASS—														
Snogg	Horten ..	{1918- 1920}	173.9	18	5.4	2	250	3,500	25	2 3-in.	4 18 -in.	31	30	—
Brand	Horten ..	1900	130.9	16.0	6.9	1	100	1,100	21	2 m.	2 18 -in.	19	17	—
Laks	Horten ..	1901	126.4	15.0	6.9	1	100	1,150	21.8	2 m.	2 18 -in.	19	—	—
Sleipner	Horten .. Fredrikstad	1936	236.3	25.5	6.9	2	625	12,500	30	3 4-in., 1 1.5-in. A.A.	2 21 -in.	72	—	—
Gyller		1939											—	—
Odin, Balder, Tor ..		—											—	
SECOND CLASS—														
Kjek, Hvas	Fredrikstad	1898	114.5	14.5	6.0	1	73	650-750	19-20	2 m.		14	11	—
Hauk, Falk	Horten ..	1903											16	—
Skarv, Teist	Horten ..	1906-7	133	14.5	6.5	1	100	1,600	25	2 3-pr.	2 18 -in.	16	15	—
Lom			117	14.5	5.7	1	72	1,100	23	2 m.			16	—
Orn			113	14.5	5.7	1	73	850	23	2 m.			16	—
Kjell	Horten ..	1912	135	14.9	6.4	1	100	1,800	25	2 3-pr.		19	15	—
SUBMARINES—														
B 1.	Horten ..	1922	167.3	17.5	10.5	2	413 545	900 640	14.5 10	1 3-in.	4 18 -in.	23	—	21

Soviet Union.

Some of the details given below are uncertain.

Name or Number.	Where Built.	Launched.	Dimensions.			Number of Screws.	Displacement.	Horse-Power.	Designed Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.
			Length. (Extreme.)	Beam.	Draught.								
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
FLOTILLA LEADERS—													
Leningrad	1935	430	1950	{ 5 5·1-in. 2 3-in. A.A.	21- in.
Kharkov	1936											
Minsk	1936											
Perekop	1937											
Stalingrad	1937											
Moscow	1937											
Kiev	1937											
Volochevka	1937											
Arkhangelsk	1940											
Kronstadt	1939											
Murmansk	1940											
Petrosavodsk	1940											
DESTROYERS—													
Serditi	1938- 1940	2	1600	50,000	38	{ 4 5·1 in., 2 1·5 A.A.	{ 6 21- in.
Smely													
Stremitelny ..													
Smetiliv													
Gromki													
Grozni													
Bodri													
Gnevni													
Gordy													
Gremyashchi ..													
Grozovoy	Ship & Eng. Co., Niko- laev	1917	303	29·5	10·5	2	1326	20,000	28	{ 4 4-in., 2 7- pr., 4 m., can carry 80 mines	{ 12 18- in. (T.)	120	— 390
Groznyashchi ..													
Besposhtchadni													
Felix Dzerzhinski													
Petrovski													
Nezamojni													
Shaumyan													
Karl Marx													
Kalinin													
Karl Liebknecht													
Uritsky	Leningrad..	1914	321	31	9·25	2	1610	32,000	29	{ 5 4-in., 1 3- in. A.A., carries mines	{ 9 18- in. (T.)	{ 120	— 400
Volodarski													
A. Zhdanov													
Engels													
Stalin													
Artem	Leningrad..	1915	315	31	10	2	1260	30,000	28	{ 4 4-in., 1 3-in. A.A., 2 m., 80 mines	{ 9 18- in. (T.)	{ 110	— 350
Volkov													
Lenin													
Bezpochtachadni													
(ex-Frunze) ..													
Sneg	Nikolaev	1932	236	24	10	2	700	13,200	29	{ 2 4-ins., 3 3-in., 2 m. 40 mines.	{ 9 18- in.	72	..
Shtorm													
Shkval													
Groza, Metall,													
Smertsch, Taifun,													
Uragan, Wiche,													
Wluga, Zyklon,													
Grom, Vikhr,													
Burya, Purga,													
Tucha													
Sovnarkom	Leningrad	1933-35	236	24	10	2	700	13,200	29	{ 2 4-in., 3 3-in., 2 m. 40 mines	{ 9 18- in.	72	..
Stamor													
Sokki													
Sibirsk													
Molnlya													
Sasovyets	Leningrad	1933-35	236	24	10	2	700	13,200	29	{ 2 4-in., 3 3-in., 2 m. 40 mines	{ 9 18- in.	72	..
Serp													
Zarnitza													
Lukoi	Leningrad	1933-35	236	24	10	2	700	13,200	29	{ 2 4-in., 3 3-in., 2 m. 40 mines	{ 9 18- in.	72	..

Soviet Union—continued.

Name or Number.	Where Built.	Launched.	Dimensions.			Number of Screws.	Displacement.	Horse-Power.	Designed Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.	
			Length. (Extreme.)	Beam.	Draught.								Coal	Oil
GUARD SHIPS—														
Daerschinski }	Ansaldo	1934	Feet.	Feet.	Feet.		Tons.		Knots.	{ 2 4-in.,			Tons.	
Kirov }			250	27	9	3	800	5,400	20	{ 4 1.5-in.		120	—	44
SUBMARINES—														
Chartist }	..	1930-					1039			1 4-in.,	1	6		
Garibaldi }		1933					1335			M.G.	21-in.	..		
Karbonari }	..	1931												
Dekabrist }														
Narodovoleets }	..	1931												
Krasnogvardeets }														
Komsomolka }	..	1931					869	2500	15	1 4-in.,	1	8		
Jacobinets }			240	23	13½	2	1318	1200	8	1.5 in.,	1 M.	21-in.	44	78
Revolusioner }	..	1936												
Spartakovets }														
12 others }	..	1935-												
About 100 Type		1941	150				200		13	1 1.5-in.		2		
M }	..	1935-							8			18-in.		
About 100 Type		1941	200				500			1 1.5-in.		6		
Schtsch }	..	1936					1200					21-in.		
Pravda }							1800			2 4-in.,	2 M.	21-in.		
Iskra }	..	1916-												
Zvezda and 4 others		1917	223	14½	12.6	2	650	2600	16	2 6-pr.,	1	4		
Bolshevik }	St. Petersburg	1917					790	900	9	M.G.	18-in.	33	—	40
Komissar }														
Kommunar }	..	1917												
Tovarisnch }														
Krasnoarmeets }	..	1917												
Krasnoflotets }														
Bednyak }	..	1917					870	2400	17	1 4-in.,	1	6		
Proletarii }							1139	1600	10	M.G.	21-in.	4		
Batrak }	..	1917					620	1200	13½	1 1.57-in.,		4		
Rabochi }							820	700	8½	20 mines	21-in.	40		
Metallist }	..	1917												
Kommunist }														
Marxist }	..	1917												
Politrabotrik }														
L55 (ex-British) ..	..	1917	230	24	13	2	870	2400	17	1 4-in.,	1	6		
*Lembik }	Vickers	1937					1139	1600	10	M.G.	21-in.	4		
*Kalev }			190	24½	11	2	620	1200	13½	1 1.57-in.,		4		
							820	700	8½	20 mines	21-in.	40		

• ex-Estonian.

Spain.

Name or Number.	Where Built.	Launched.	Dimensions.			Number of Screws.	Displacement.	Horse-Power.	Maximum Trial Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel Coal Oil
			Length. (Extreme.)	Beam.	Draught.								
DESTROYERS—													
Gravina	Cartagena ..	1934	333	31·7	10·5	2	1536	42,000	36	{ 5 4·7-in. 13-in. A.A. 4 M. }	6 21-in. (T.)	175	— 540
Escano		1930											
Ciscar		1931											
Jorge Juan		1929											
Ulloa		1930											
Almirante Valdés..		1930											
„ Antequera		1931											
„ Miranda		1929											
Churrucá		1930											
Alcala Galiano ..		1928											
Lepanto	1928												
José Luis Díez ..	1926												
Sanchez-Barcaistegui	1924												
Juan Lazaga	1923												
Valeseo	1922												
Alsedo													
TORPEDO BOATS—													
T 7, 9, 14, 16, 17, 18, 19	Cartagena ..	{ 1913 1922 }	{ 164	{ 16·5	{ 6½	{ 3	{ 187	{ 3750	{ 26	{ 3 1·9-in.	{ 3 18-in.	{ 31	{ 33 —
SUBMARINES—													
D1, 2, 3	Cartagena ..	{ 1934 —1935 }	{ 276	{ 21·8	{ 13	{ 2	{ 1050 1375	{ 5000 1350	{ 20·5 9·5	{ 1 4·7-in., 4 M.	{ 6 21-in.	{ ..	{ ..
C 2, 4	Cartagena ..	{ 1928 —1929 }	{ 247	{ 20·8	{ 13·5	{ 2	{ 900 1270	{ 2000 750	{ 16 8·5	{ 1 3-in. A.A.	{ 6 21-in.	{ 40	{ 200
Isaac Peral (ex-C 1)													
B 2	Cartagena ..	1921-24	210	18·9	11·25	2	560 830	1400 850	16 10·5	1 3-in. A.A.	4 18-in.	28	— 66
Mola	Taranto	1934	231·5	22·5	13	2	880 1230	3000 1300	17 8·5	2 3·9-in. 2 M.O.	8 21-in.	48	150
San Jurjo													
3 in number		Bldg.											

Sweden.

Name or Number.	Where Built.	Launched.	Dimensions.			Number of Screws.	Displacement.	Horse-Power.	Maximum Trial Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel	
			Length. (Extreme.)	Beam.	Draught								Coal Oil	
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons	
DESTROYERS—														
*Göteborg ..	Gothenburg ..	1935 }	304	29-6	12½	2	1,030	32,000	39	{ 3 4-7-in.,	6	120	—	
Stockholm ..	Karlskrona ..	1936 }								{ 4 1-in.	21-in.		150	
*Klas Horn ..	Malmö ..	1931 }	304-2	29-2	10-5	2	1,000	24,000-26,000	35	{ 3 4-7-in., 2	2 trpl.	125	—	
*Klas Ugglå ..	Karlskrona ..													
Ehrensköld ..	Göteborg ..													
Nordenskjöld ..	Malmö ..	1926 }								{ A.A., 2 M.	21-in.		150	
Wale ..	Malmö ..	1906	216	20-8	9	2	354	8,000	30	2 3-in., 4 6-prs.	4 18-in.	69	80	
Ragnar† ..	Malmö ..	1909 }	216	20-8	9	2	354	{ 8,000-9,000 }	30-0	{ 4 3-in.,	2 18-in.	67	80	
Sigurd ..	Gothenburg ..	1909 }												
Vidar ..	Malmö ..	1909 }												
Hugin ..	Gothenburg ..	1909 }												
Munin ..	Malmö ..	1910 }												
Wrangel ‡	Gothenburg ..	1917	232-8	22	9-2½	2	458	11,000	34-0	4 3-in., 2 M.	6 18-in.	72	107	
Wachtmeister }														
Malmö ..	Gothenburg ..	1938 }	304	29½	12½	2	1,030	32,000	39	{ 3 4-7-in.,	6 21-in.	130	—	
Karlskrona ..	Karlskrona ..	1939 }												
Norrköping ..	Gothenburg ..	1940 }												
Gjælvle ..	Gothenburg ..	1940 }												
†Pulce (ex-Ricasoli) }	Naples ..	1926	278-6	28-2	8-7	2	935	36,000	35	{ 4 4-7-in.,	4 21-in.	106	—	
†Psilander (ex-Nicotera) }														
†Romulus (ex-Spica) }														
†Remus (ex-Astore) }														
4 in Number ..		Bldg.												
SUBMARINES—														
1st Class—														
Ulven ..	Naval Yard, Karlskrona	{ 1930 }	213	21	10-8	..	700	2,800	16	1 4-in., 1 M.	4 20-in.	32	—	
Draken ..		{ 1926 }					850	—	9		4 18-in.			
Gripen ..		{ 1928 }					500	2,800	15		4 18-in.			
Bavern ..	Naval Yard, Karlskrona	1921	185	18-5	9-2	..	650	—	9	1 3-in., 1 M.	4 18-in.	..	33	
Illern ..							650	—	9		4 18-in.			
Uttern ..	Kockum Co., Malmö	1920	171	16-5	11-5	..	450	2,800	..	1 3-in., 1 M.	4 18-in.	..	23	
Sälen ..							580	—	..		4 18-in.			
Valrossen							492	—	15		4 18-in.			
Hajen ..	Kalskrona ..	1925	186	23-2	9-4	..	650	..	9	1 3-in., 1 M.	4 18-in.	..	34	
Valen ‡ ..							650	..	9		4 18-in.			
Nordkaparen	Kockum	1935 }	199	20½	11	..	500	..	15	1 4-in.	4 21-in.	28	..	
Delfinen ..							720	..	10		4 21-in.			
Springaren		1936 }					—	..	15	1 4-1-in., 2	4 21-in.	32
Sjölejonet	Kockum		204	20½	11	2	620	..	10		4 21-in.			
Sjöbjörnen	1938 }	—					..	10	M.G.	4 21-in.				
Sjöhunden	..		Bldg.		4 21-in.
Several in number												4 21-in.		

* These destroyers sank during an explosion in 1941. Göteborg has been raised and towed to a shipyard. The salvaging of Klas Horn and Klas Ugglå is proceeding.

† Ex-Italian.

‡ Fitted for mine-laying.

United States.

Name or Number.	Where built.	Completed.	Dimensions.			Number of Screws.	Standard Displacement.	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.
			Length. (Extreme.)	Beam.	Draught.								
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
DESTROYERS—													
Fletcher ..	Boston, N.Y.												
Radford ..	Charleston, N.Y.												
Jenkins ..	Federal S.B. Co.												
La Vallette ..	Bath, I.W.												
Nicholas ..													
O'Bannon ..													
Chevalier ..													
Percival ..	Federal S.B. Co.												
Sauley ..													
Waller ..													
Strong ..	Bath I.W.												
Taylor ..													
De Haven ..													
Bache ..	Bethlehem												
Beale ..													
Guest ..													
Bennet ..													
Fullam ..	Boston, N.Y.												
Hudson ..													
Hutchins ..													
Pringle ..	Charleston, N.Y.												
Stanly ..													
Stevens ..	Puget Sound, N.Y.												
Halford ..													
Leutze ..													
Watson ..													
Philip ..	Federal S.B. Co.												
Renshaw ..													
Ringgold ..													
Schroeder ..													
Sigsbee ..													
Conway ..													
Cony ..													
Converse ..													
Eaton ..													
Foot ..													
Spence ..	Bath, I.W.												
Terry ..													
Thatcher ..		Bldg.	..	..	..	..	..	..	..	..	..	..	..
Anthony ..													
Wadsworth ..													
Walker ..													
Brownson ..													
Daly ..	Bethlehem, Staten Island												
Isherwood ..													
Kimberley ..													
Luce ..													
Abner Read ..													
Ammen ..													
Mullany ..													
Bush ..													
Trathen ..													
Hazelwood ..													
Heerman ..													
Hoel ..	Bethlehem, San Francisco												
McCord ..													
Miller ..													
Owen ..													
Putnam ..													
Stephen Potter ..													
Tingey ..													
Twining ..													
Yarnall ..													
Boyd ..													
Bradford ..	Bethlehem, San Pedro												
Brown ..													
Cowell ..													
Capps ..													
David W. Taylor ..	Gulf S.B. Co.												
Evans ..													
John D. Henley ..													
Franks ..													
Haggard ..	Seattle												
Halley ..	Tacoma												
Johnston ..	S. B. Co.												

United States—continued.

Name or Number.	Where built.	Completed.	Dimensions.			Number of Screws.	Standard Displacement.	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel Oil.
			Length. (Extreme.)	Beam.	Draught.								
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
DESTROYERS—													
<i>continued.</i>													
Laws ..	Seattle-Tacoma S.B. Co.												
Longshaw ..													
Morrison ..													
Priethett ..													
Robinson ..													
Roes ..													
Rowe ..													
Smalley ..													
Stoddard ..													
Watts ..													
Wren ..	Consolidated Steel Co., Orange												
Aulick ..													
Charles ..													
Ausburn ..													
Claxton ..													
Dyson ..													
Harrison ..													
John Rodgers ..													
McKee ..													
Murray ..													
Sproston ..	Boston, N.Y.												
Wickes ..													
William D. Porter ..													
Young ..													
Charette ..													
Conner ..													
Hall ..													
Halligan ..													
Haraden ..													
Newcomb ..													
Bell ..	Charleston, N.Y.												
Burns ..													
Lzard ..													
Paul ..													
Hamilton ..													
Twiggs ..													
Howorth ..													
Killen ..													
Mansfield ..													
Metcalfe ..													
Shields ..	Puget Sound, N.Y.	Bldg.	..	..	..	..	..	..		..	..	..	..
Wiley ..													
Abbott ..													
Braine ..													
Erben ..													
Hale ..													
Sigourney ..													
Stemmel ..													
Ingraham ..													
Bristol ..													
Ellyson ..	Federal S.B. Co.												
Hambleton ..													
Rodman ..													
Emmons ..													
Macomb ..													
Laffey ..													
Woodworth ..													
Forrest ..													
Fitch ..													
Corry ..													
Hobson ..	Charleston, N.Y.												
Aaron Ward ..													
Buchanan ..													
Lansdowne ..													
Lardner ..													
McCalla ..													
Mervine ..													
Quick ..													
Farenholt ..													
Bailey ..													
Carmick ..	Bethlehem, Staten Is.												
Doyle ..													
Endicott ..													
McCook ..													
Frankford ..													
	Seattle-Tacoma S.B. Co.												

United States—continued.

Name or Number.	Where built.	Completed.	Dimensions.			Number of Screws.	Standard Displacement.	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.
			Length.	Beam.	Draught.								
			(Extreme.)										
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons
DESTROYERS— <i>continued.</i>													
Brancroft ..	Bethlehem, Fore River	Bldg.
Barton ..													
Boyle ..													
Champlin ..													
Meade ..													
Murphy ..	Bethlehem, San Francisco												
Parker ..													
Caldwell ..													
Coghlan ..													
Frazier ..													
Gansevoort ..	Bethlehem, San Pedro												
Gillispie ..													
Hobby ..													
Kalk ..													
Kendrick ..													
Laub ..	Federal S.B. Co.												
MacKenzie ..													
McLanahan ..													
Nields ..													
Ordonaux ..													
Dawison ..	Seattle- Tacoma S.B. Co.												
Edwards ..													
Glennon ..													
Jeffers ..													
Maddox ..													
Nelson ..	Boston, N.Y.												
Baldwin ..													
Harding ..													
Satterlee ..													
Thompson ..													
Welles ..	Philadelphia, N.Y.												
Cowie ..													
Knight ..													
Doran ..													
Earle ..													
Butler ..	Norfolk, N.Y.												
Gherardi ..													
Herndon ..													
Shubrick ..													
Beatty ..													
Tillman ..	Charleston, N.Y.												
Stevenson ..													
Stockton ..													
Thorn ..													
Turner ..													
Jouett ..	Federal S.B. Co.												
Davis ..													
Sampson ..													
Warrington ..													
Somers ..													
Winslow ..	Bath, I.W.												
McDougall ..													
Selfridge ..													
Porter ..													
Balch ..													
Moffett ..	New York S.B. Co.												
Clark ..													
Phelps ..													
Anderson ..													
Swanson ..													
Nicholson ..	Bethlehem, Fore River												
Woolsey ..													
Monssen ..													
Wilkes ..													
Meredith ..													
Ericsson ..	Bethlehem, Fore River												
Ludlow ..													
Grayson ..													
Edison ..													
Gwin ..													
Eberle ..	Federal S.B. Co.												
Livermore ..													
Kearney ..													
Plunkett ..													

United States—*continued.*

Name or Number.	Where built.	Completed.	Dimensions.			Number of Screws.	Standard Displacement.	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.
			Length. (Extreme.)	Beam.	Draught.								
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
DESTROYERS—<i>continued.</i>													
Charles F. Hughes	Charleston	1939–1940	341 W.L.	35½	10½	2	1,620	50,000	37	5 5-in.	10 21-in.	..	..
Hillary P. Jones	Puget Sound												
Lansdale	Boston, N.Y.	1939	341 W.L.	35½	10½	2	1,570	50,000	37	5 5-in.	12 21-in.	160	..
Madison	Bath, I.W.												
Niblack	Maine	1939	341 W.L.	35½	10½	2	1,500	50,000	37	4 5-in.	16 21-in.	155	..
Gleaves	Bethlehem S. Co. Quincy												
Mayo	Philadelphia, N.Y.	1939	341 W.L.	35½	10½	2	1,500	50,000	37	4 5-in.	16 21-in.	155	..
Benson	Norfolk, N.Y.												
Buck	Charleston	1938	341 W.L.	35½	10½	2	1,500	50,000	37	4 5-in.	16 21-in.	155	..
Wainwright	Norfolk, N.Y.												
Roe	Norfolk, N.Y.	1938	341 W.L.	35½	10½	2	1,500	50,000	37	4 5-in.	16 21-in.	155	..
Morris	Norfolk N.Y.												
Walke	Boston, N.Y.	1939	341 W.L.	35½	10½	2	1,500	50,000	37	4 5-in.	16 21-in.	155	..
O'Brien	Newport News												
Russell	Federal S.B. & D.D. Co.	1939	341 W.L.	35½	10½	2	1,500	50,000	37	4 5-in.	16 21-in.	155	..
Hamman	Bath, I.W.												
Hughes	Co.	1939	341 W.L.	35½	10½	2	1,500	50,000	37	4 5-in.	16 21-in.	155	..
Sims	Puget Sound												
Wilson	Charleston	1938	341 W.L.	35½	10½	2	1,500	50,000	37	4 5-in.	16 21-in.	155	..
Sterrett	Norfolk, N.Y.												
Stack	Norfolk, N.Y.	1938	341 W.L.	35½	10½	2	1,500	50,000	37	4 5-in.	16 21-in.	155	..
Rowan	Philadelphia, N.Y.												
Rhind	Norfolk, N.Y.	1938	341 W.L.	35½	10½	2	1,500	50,000	37	4 5-in.	16 21-in.	155	..
Trippe	Boston, N.Y.												
Mayrant	Boston, N.Y.	1936–1938	341 W.L.	35½	10½	2	1,500	50,000	37	4 5-in.	16 21-in.	155	..
Maury	Bethlehem S.B. Co.												
McCall	Federal S.B. & D.D. Co.	1938–1939	341 W.L.	35½	10½	2	1,500	50,000	37	4 5-in.	16 21-in.	155	..
Lang	Navy Yard, Puget Sound												
Ellet	Navy Yard, Mare Is.	1936–1938	341 W.L.	35½	10½	2	1,500	50,000	37	4 5-in.	16 21-in.	155	..
Benham	Navy Yard, Boston												
Jarvis	Navy Yard, Boston	1936–1938	341 W.L.	35½	10½	2	1,500	50,000	37	4 5-in.	16 21-in.	155	..
Patterson	Navy Yard, Boston												
Henley	Navy Yard, Boston	1936–1938	341 W.L.	35½	10½	2	1,500	50,000	37	4 5-in.	16 21-in.	155	..
Ralph Talbot	Navy Yard, Boston												
Mugford	Navy Yard, Boston	1936–1938	341 W.L.	35½	10½	2	1,500	50,000	37	4 5-in.	16 21-in.	155	..
Helm	Navy Yard, Boston												
Blue	Norfolk	1936	341 W.L.	35½	10½	2	1,500	50,000	37	4 5-in.	16 21-in.	155	..
Bagley	Bethlehem S.B. Co.												
Craven	United D.D. Co.	1937	341 W.L.	35½	10½	2	1,500	50,000	37	4 5-in.	16 21-in.	155	..
Gridley	United D.D. Co.												
Fanning	United D.D. Co.	1936–1938	341 W.L.	35½	10½	2	1,500	50,000	37	4 5-in.	16 21-in.	155	..
Dunlap	United D.D. Co.												
Mahan	United D.D. Co.	1936–1938	341 W.L.	35½	10½	2	1,500	50,000	37	4 5-in.	16 21-in.	155	..
Cumming	Inc., N.Y.												
Drayton	Bath, I.W.	1936–1938	341 W.L.	35½	10½	2	1,500	50,000	37	4 5-in.	16 21-in.	155	..
Lamson	Co.												
Flusser	Federal S.B. & D.D. Co.	1936–1938	341 W.L.	35½	10½	2	1,500	50,000	37	4 5-in.	16 21-in.	155	..
Reid	Navy Yard, Boston												
Case	Navy Yard, Boston	1935	341 W.L.	35½	10½	2	1,500	50,000	37	4 5-in.	16 21-in.	155	..
Conyngham	Norfolk												
Tucker	Navy Yard, Boston	1935	341 W.L.	35½	10½	2	1,500	50,000	37	4 5-in.	16 21-in.	155	..
Cushing	Navy Yard, Boston												
Perkins	Puget Sound	1935	341 W.L.	35½	10½	2	1,500	50,000	37	4 5-in.	16 21-in.	155	..
Smith	Navy Yard, Mare Is.												
Preston	Navy Yard, Boston	1935	341 W.L.	35½	10½	2	1,500	50,000	37	4 5-in.	16 21-in.	155	..
Dale	Navy Yard, Boston												
Monaghan	Navy Yard, Boston	1935	341 W.L.	35½	10½	2	1,500	50,000	37	4 5-in.	16 21-in.	155	..
Aylwin	Philadelphia												

United States—continued.

Name or Number.	Where built.	Completed.	Dimensions.			Number of Screws.	Displacement.	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.
			Length. (Extreme.)	Beam.	Draught.								
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
DESTROYERS— <i>continued.</i>													
Farragut ..	Bethlehem S.B. Co.	1934					1,365						
Dewey ..	Bath, I.W.Co.						1,345						
Hull ..	Navy Yard, N.Y.		334	34½	9½	2	1,395	42,800	36½	5 5-in. A.A., 8 M.G.	2 Q. 21-in.	160	400
MacDonough ..	Navy Yard, Boston	1935					1,395						
Worden ..	Navy Yard Puget Sound						1,410						
*William B. Preston ..	Norfolk, N.W.	1920											
Noa ..		1921											
*Hulbert ..		1920											
Decatur ..		1922											
Perry ..		1922						26,000					
Trever ..	Navy Yard, Mare Island.	1922											
Wasmuth ..		1921											
Zane ..		1921											
Litchfield ..		1920											
*Thornton ..	Bethlehem S.B. Co., Squantum	1919								4 4-in., 13-in. A.A. (Kane, Fox, Brooks, Gilmer, and Hatfield have 4 5-in. guns.)	4 triple 21-in.	122	375
*Ballard ..													
*Greene ..													
*Gillis ..	Bethlehem S.B. Co., Quincy												
*Osmond In-gram ..													
*Belknap ..		1921	314·4	31	9·8	2	1,190		35				
Lawrence ..		1921											
Hopkins ..		1920											
Barry ..		1921											
Goff ..		1921											
Bainbridge ..		1921											
*Williamson ..													
Sands ..													
King ..	New York S.B. Co.							27,000					
*Childs ..													
Sturtevant ..													
Overton ..		1920											
*McFarland ..													
Humphreys ..													
Kane ..													
Fox ..													
Gilmer ..													
Brooks ..													
Hatfield ..													
Paul Jones ..		1921											
Truxton ..													
John D. Ford ..	Cramp, Pa.												
Pillsbury ..		1920											
Peary ..													
Pope ..													
Stewart ..													
McCormick ..			314·4	31	9·8	2	1,190	26,000	35	4 4-in., 13-in. A.A. (Parrot, Whipple, Edws. & Borie have 4 5-in. guns.)	4 triple 21-in.	122	375
Bulmer ..													
Simpson ..													
MacLeish ..													
Edsall ..													
Parrott ..													
Whipple ..													
J. D. Edwards ..	Cramp, Pa.	1920											
Borie ..													
Barker ..													
Broome ..													
Long ..		1919	314·4	31	9·8	2	1,190	27,000	35	4 4-in., 13-in. A.A. (Long and Hovey have 6 4-in. twin mtgs. and 1 3-in. A.A.)	4 triple 21-in.	122	375
Hovey ..													
Southard ..													
Chandler ..													
Dallas ..		1920											
*George E. Badger ..	Newport News S.B. Co.	1921	314·4	31	9·8	2	1,190	25,000	35	4 4-in., 1 3-in. A.A.	4 triple 21-in.	122	375
*Goldsborough ..		1920											
†Dahlgren ..													
*Clemson ..		1919											

* Seaplane tenders.

† Experimental vessel.

United States—*continued.*

Name or Number.	Where built.	Completed.	Dimensions.			Number of Screws.	Displacement.	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.
			Length. (Extreme.)	Beam.	Draught.								
DESTROYERS— continued.			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
† Stansbury ..	Union, I.W.	1919	314·4	31	9·8	2	1,060	27,000	35	4 4-in., 1 3-in. A.A.	4 triple 21-in.	122	283
† Howard ..													
† Hogan ..													
Crosby ..	Fore River S.B. Co.												
† Palmer ..	N.Y. S.B. Co.	1918	314·4	31	9·8	2	1,090	26,000	35	4 4-in., 1 3-in. A.A.	4 triple 21-in.	122	286
Herbert ..													
Schenck ..													
Leary ..	Cramp, Phil.	1919	314·4	31	9·8	2	1,090	26,000	35	4 4-in., 1 3-in. A.A.	4 triple 21-in.	122	286
Dickerson ..													
J. Fred Talbot ..													
Cole ..	Mare Island, N.Y.	1918	314·4	21	9·5	2	1,090	24,200	35	4 4-in., 1 3-in. A.A.	4 triple 21-in.	122	286
Ellis ..													
Bernadou ..													
Dupont ..	New York S.B. Co.	1919	314·4	31	9·8	2	1,090	26,000	35	4 4-in., 1 3-in. A.A.	4 triple 21-in.	122	286
Biddle ..													
Blakeley ..													
Barney ..	Newport News S. Co.	1918	314·4	31	9·8	..	1,090	25,000	35	4 4-in., 1 3-in. A.A.	4 triple 21-in.	122	286
Breckenridge ..													
Roper ..													
Elliot ..	Cramp, Pa.	1918	314·4	31	9·8	..	1,090	26,000	35	4 4-in., 1 3-in. A.A. (Rathburne) has 3 4-in.)	4 triple 21-in.	122	286
Greer ..													
Tarbell ..													
Upshur ..	Union Plant.	1918	314·4	31	9·8	..	1,060	27,000	35	4 4-in., 1 3-in. A.A.	4 triple 21-in.	122	283
Hamilton ..													
Ward ..													
Kennison ..	Bath, I.W.	1917	315·5	30·7	9·5	..	1,020	20,000	32	3 4-in. 1 3-in. A.A.	12 21-in.	122	260
Kilty ..													
Talbot ..													
Rathburne ..	Bath, I.W.	1917	315·3	29·9	9·8	..	920	17,500	30	4 4-in. 1 3-in. A.A.	4 triple 21-in.	122	290
Crane ..													
Chew ..													
Schley ..	Fore River S.B. Co.	1918	314·4	31	9·8	..	1,060	27,000	35	4 4-in. 1 3-in. A.A.	4 triple 21-in.	122	283
§ McKean ..													
§ Colhoun ..													
§ Stringham ..	Bath Iron- works	1930	314·4	30·5	9	2	1,160	27,000	35	4 4-in. 1 3-in. A.A. 92 mines	—	107	375
§ Gregory ..													
§ Little ..													
§ Manley ..	Cramp	1918	314·4	30·5	9	2	1,160	25,000	35	4 4-in. 1 3-in. A.A. 92 mines	—	120	286
Allen ..													
Montgomery ..													

† Minesweepers.

‡ Equipped as targets, wireless controlled.

§ Destroyer transports.

United States—*continued.*

Name or Number.	Where built.	Completed.	Dimensions.			Number of Screws.	Displacement. Surface.	Displacement. Submerged.	Horse-Power.	Maximum Speed. Surface.	Maximum Speed. Submerged.	Armament.	Torpedo/Tubes.	Complement.	Fuel. Oil.													
			Length. (Extreme.)	Beam.	Draught.																							
			Feet.	Feet.	Feet.		Tons.			Knots.					Tons.													
SUBMARINES—																												
Angler ..	Electric Boat Co.	Bldg.	17 8	10 21- in.													
Bashaw ..																												
Bluegill ..																												
Bream ..																												
Cavalla ..																												
Cobia ..																												
Croker ..																												
Dace ..																												
Dorado ..																												
Flasher ..																												
Flier ..																												
Flounder ..																												
Gabilan ..																												
Gunnel ..																												
Gurnard ..																												
Haddo ..	Manitowog S.B. Co.	Bldg.																										
Hake ..																												
Harder ..																												
Hoe ..																												
Jack ..																												
Lapon ..																												
Mingo ..																												
Muskallonge ..																												
Paddle ..																												
Pargo ..																												
Peto ..																												
Pogy ..																												
Pompon ..																												
Puffer ..																												
Rasher ..	Navy Yard, Portsmouth	Bldg.																										
Raton ..																												
Ray ..																												
Redfin ..																												
Robald ..																												
Rock ..																												
Runner ..																												
Sawfish ..																												
Scamp ..																												
Scorpion ..																												
Snook ..																												
Steelhead ..																												
Sunfish ..																												
Tunny ..																												
Tinosa ..	Electric Boat Co.	Bldg.																										
Tullibee ..																												
Gar ..																												
Grampus ..																												
Grayback ..																												
Grayling ..																												
Grenadier ..																												
Gudgeon ..																												
Gato ..																												
Greenling ..																												
Grouper ..																												
Growler ..																												
Grunlon ..																												
Guardfish ..																												
Drum ..	Portsmouth Navy Yard.	Bldg.																										
Flying Fish ..																												
Finback ..																												
Haddock ..																												
Halibut ..																												
Silversides ..																												
Trigger ..																												
Wahoo ..																												
Whale ..																												
Albacore ..																												
Amberjack ..																												
Barb ..																												
Blackfish ..																												
Bluefish ..																												
Bonfish ..	Electric Boat Co.	Bldg.																										
Cod ..																												
Cero ..																												
Corvina ..																												
Darter ..																												

United States—continued.

Name or Number.	Where built.	Completed.	Dimensions.			Number of Screws.	Displacement. Surface. Submerged.	Horse-Power.	Maximum Speed. Surface. Submerged.	Armament.	Torpedo Tubes.	Complement.	Fuel. Oil.
			Length. (Extreme.)	Beam.	Draught.								
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
SUBMARINES—continued.													
Herring ..	Portsmouth Navy Yard.	Bidg.											
Kingfish ..	Electric Boat Co. } 1941	Bidg.	..	..	..	..	800	..	..	..	6 21-in.	..	..
Shad ..													
Mackerel ..	Portsmouth Navy Yard.												
Marlin ..	Electric Boat Co. }	1936-1937	300½	25	13-8	2	1,330 1,998	..	17 8	1 3-in.	6 21-in.	54	..
Perch ..													
Pickrel ..	Portsmouth Navy Yard.												
Permit ..	Mare Island Navy Yard.												
Plunger ..	Electric Boat Co. }	1940	298	27	13-3	2	1,475	..	..	1 3-in.	10 21-in.	..	..
Pollack ..													
Pompano ..	Portsmouth Navy Yard.												
Tambor ..	Electric Boat Co. }	1941	W.L.										
Tautog ..													
Thresher ..	Portsmouth Navy Yard.												
Triton ..	Mare Island Navy Yard.												
Trout ..	Electric Boat Co. }	1939	298	26	14½	2	1,450	..	17 8	1 3-in.	6 21-in.	55	..
Tuna ..													
Salmon ..	Portsmouth Navy Yard.												
Seal ..	Mare Island Navy Yard.												
Skipjack ..	Electric Boat Co.												
Shapper ..	Portsmouth Navy Yard.												
Stringray ..	Mare Island Navy Yard.												
Sturgeon ..	Electric Boat Co. }	1940	298	26	14½	2	1,450	..	17 8	1 3-in.	6 21-in.	55	..
Sargo ..													
Saury ..	Portsmouth Navy Yard.												
Spearfish ..	Mare Island Navy Yard.												
Sculpin ..	Electric Boat Co.												
Sailfish ..	Portsmouth Navy Yard.												
(sz-Squalus)	Mare Island Navy Yard.												
Swordfish ..	Electrical Boat Co.												
Sea Dragon ..	Portsmouth Navy Yard.												
Sea Lion ..	Electric Boat Co.												
Sea Raven ..	Portsmouth Navy Yard.												
Seawolf ..	Electric Boat Co.												
Porpoise ..	Portsmouth Navy Yard.												
Pike ..	Electric Boat Co. }	1936	283	24-9	13	2	1,310 1,934	5,000	21	1 3-in.	6 21-in.	55	..
Shark ..													
Tarpon ..	Portsmouth Navy Yard.												
Dolphin ..	Electric Boat Co. }	1936	298	25-1	13-9	2	1,315	5,000	21	1 3-in.	6 21-in.	54	..
	Portsmouth Navy Yard.												
Cachalot ..	Portsmouth Navy Yard.												
Cuttlefish ..	Electric Boat Co.												
Argonaut ..	Portsmouth Navy Yard.												
Narwhal ..	Portsmouth Navy Yard.												
Nautilus ..	Mare Island Navy Yard.												
Bonita ..	Portsmouth Navy Yard. }	1926	341-5	27	14-6	2	2,000 2,506	6,700 1,200	19 8	1 3-in. A.A.	6 21-in.	87	160
Bass ..													
Barracuda ..	Portsmouth Navy Yard.												
S48 ..	Lake T.B. Co., Bridgeport.												
S47* ..	Bethlehem Shipbuilding Corp., Quincy Plant.	1922	267	21-8	13-5	2	1,000 1,458	2,000 1,500	14-8 11-0	1 4-in.	4 21-in.	38	237
S46* ..		1925	225-3	20-5	16	2	850 1,126	1,200 1,500	14 10-4	1 4-in.	4 21-in.	44	154
S45* ..		1925											
S44* ..		1925											
S43* ..		1924											
S42* ..		1924											
S41* ..		1924											
S40* ..		1923											
S39* ..		1923											
S38* ..		1923											
S37* ..		1923											
S36* ..		1923											
S35* ..	Bethlehem Shipbuilding Corp., Union Plant.	1923					800 1,062	1,200 1,500	14-5 11	1 4-in.	4 21-in.	42	140
S34* ..		1923											
S33* ..		1923											
S32* ..		1923											
S31* ..		1923											
S30* ..		1920											

* Designed by Electric Boat Co., Groton, Conn.

United States—*continued.*

Name or Number.	Where built.	Completed.	Dimensions.			Number of Screws.	Displacement. Surface. Submerged.	Horse-Power.	Maximum Speed. Surface. Submerged.	Armament.	Torpedo Tubes.	Complement.	Fuel. Oil.			
			Length. (Extreme).	Beam.	Draught.											
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.			
SUBMARINES— <i>continued.</i>																
S29*	Bethlehem Shipbuilding Corp., Quincy Plant.	1924	219.3	20.5	16	2	$\frac{800}{1,062}$	$\frac{1,200}{1,500}$	$\frac{14.5}{11}$	1 4-in.	4 21-in.	42	146.			
S28*		1923														
S27*		1924														
S26*		1923														
S25*		1923														
S24*		1923														
S23*		1923														
S22*		1924														
S21*		1923														
S20*		1922														
S18*		1923														
S17	Lake T.B. Co., Bridgeport.	1921	231	21.5	13	2	$\frac{790}{1,092}$	$\frac{2,000}{1,200}$	$\frac{15.25}{9}$	1 4-in.	4 21-in.	38	123.			
S16		1920														
S15		1921														
S14	Portsmouth Navy Yard.	1921	231	21.8	13	2	$\frac{790}{1,092}$	$\frac{2,000}{1,200}$	$\frac{14.75}{9}$	1 4-in.	5 21-in.	38	123.			
S13		1923														
S12		1923														
S11		1923														
S1*	Fore River S.B. Co.	1920	219.3	20.7	16	2	$\frac{800}{1,062}$	$\frac{1,200}{1,500}$	$\frac{14.5}{11}$	1 4-in., 1 aeroplane	4 21-in.	38	140			
R20*	Union, I.W.	1918	186.1	17.5	14.5	2	$\frac{530}{680}$	$\frac{880}{934}$	$\frac{13.5}{10.5}$	1 3-in.	4 21-in.	30	63			
R19*																
R18*																
R17*																
R16*																
R15*	Fore River S.B. Co.	1919				186.1	17.5	14.5	2	$\frac{530}{680}$	$\frac{880}{934}$	$\frac{13.5}{10.5}$	1 3-in.	4 21-in.	30	63
R14*																
R13*																
R12*																
R11*																
R10*																
R9*																
R7*	Fore River S.B. Co.	1919	186.1	17.5	14.5	2	$\frac{530}{680}$	$\frac{880}{934}$	$\frac{13.5}{10.5}$	1 3-in.	4 21-in.	30	63			
R6*																
R5*																
R4*																
R3*																
R2*																
R1*	Fore River S.B. Co.	1918	172.3	17.5	14.4	2	$\frac{480}{624}$	$\frac{880}{740}$	$\frac{14}{10.5}$	1 3-in.	4 21-in.	30	73			
O10*																
O8*																
O7*																
O6*																
O4*																
O3*																
O2*																

* Designed by Electric Boat Co., Groton, Conn.

The machinery contractors for the vessels of the E. B. Co. Design built in yards other than the Navy Yards were the New London Ship and Eng. Co., Groton, Conn., and the hulls were built under sub-contract from the E. B. Co.

REFERENCE SECTION.

MISCELLANEOUS.

DIARY OF NAVAL EVENTS IN 1941.

NOTE.—The dates given in this Diary are taken from accounts, both official and unofficial, which have been published in the Press. Dates derived from the latter cannot at present be guaranteed as accurate.

JANUARY.

- 3.—Bardia bombarded ; destroyer sank one and captured another ship.
- 4.—R.A.F. attack on Brest ; German destroyer hit.
- 5.—Greek destroyers bombarded Valona.
- 7-13.—Convoy through Mediterranean.
- 8.—H.M. submarine Tuna shelled U-boat in enemy waters. Loss of H.M. submarine Regulus announced.
- 10.—Italian light forces engaged off Pantellaria, torpedo boat Vega sunk ; H.M.S. Gallant damaged ; H.M.S. Southampton bombed, subsequently sunk ; H.M.S. Illustrious damaged. Fleet Air Arm attack at Palermo. Air attack on Portsmouth.
- 14.—Air attack on Plymouth.
- 16.—H.M. submarine Pandora sank two ships in Central Mediterranean. Italian liners Lombardia and Liguria torpedoed and sunk while carrying troops to Albania.
- 18.—Greek submarine Proteus sank Italian transport Sardegna.
- 20.—Greek warships sank enemy submarine.
- 21-22.—Tobruk captured.
- 24.—H.M. submarine Parthian sank supply ship south of Italy.
- 26.—H.M.S. Wallace, H.M. trawler Galvani and two drifters shot down aircraft.
- 28.—Loss of H.M. submarine Triton announced. Greek submarine Papanicolis sank transport off Brindisi.
- 30.—Loss of H.M. trawler Pelton and Dutch submarine announced.
- 31.—Trawlers Charmouth and Ratray shot down aircraft. H.M. submarine sank Italian tug. German air attack on ship carrying Italian prisoners from Libyan coast.

FEBRUARY.

- 2.—Fleet Air Arm attack on Sardinia.
- 4.—Loss of H.M. trawlers Relonzo and Luda Lady announced.
- 5.—H.M.S. Illustrious reported at Alexandria. Air attack on convoy off South-East Coast ; H.M. trawler Tourmaline sunk, H.M. trawler Lady Philomena shot down aircraft ; no ship in convoy lost.
- 7.—H.M.S. Vanity shot down aircraft. Benghazi surrendered.
- 8.—H.M. submarine sank Norwegian Ryfylke carrying German troops.
- 9.—H.M.S. Pytchley shot down aircraft. R.A.F. torpedoed destroyer off coast of Norway. Bombardment of Genoa. Loss of H.M. trawlers Almond and Arctic Trapper announced.
- 11.—Bombardment of Ostend.
- 12.—H.M. drifter Eager shot down aircraft.
- 13.—German raider, believed cruiser Hipper, sank six ships in convoy off Azores. H.M.A.S. Sydney arrived Sydney.

- 16.—Admiralty announced minefield laid off east coast of Malaya.
- 17.—Fleet Air Arm sank supply ship in Central Mediterranean ; two others damaged.
- 18.—Loss of H.M.S. Huntley announced.
- 20.—H.M. submarine Sealion sank ship off coast of Norway. H.M.S. Bramble shot down aircraft. Loss of H.M. auxiliary vessel Crispin announced.
- 22.—Bombardment of Italian Somaliland. Loss of H.M. trawler Ormonde announced.
- 23.—H.M. submarine successes announced : Triton, before being lost, sank two supply ships ; Rover, one tanker ; Upholder, two Italian supply ships ; Utmost, Truant and Regent, one supply ship each. Greek submarine Nereus sank two Italian supply ships.
- 24.—R.A.F. attacked Hipper class cruiser at Brest.
- 25.—H.M.S. Exmoor sunk by E-boats during convoy attack in North Sea. British forces occupied Castelorizo (withdrawn three days later).

MARCH.

- 2.—R.A.F. attacked Hipper class cruiser at Brest.
- 3.—R.A.F. attacked List seaplane base and convoy in North Sea ; one supply ship sunk. Loss of H.M. trawler Ouse announced.
- 4.—Lofoten Islands raided by Anglo-Norwegian forces ; armed trawler and ten other vessels sunk, fish-oil factories and oil tanks set on fire. R.A.F. attack on Italian warships bombarding Greek positions at Chimara and Valona.
- 6.—Italian submarine Anfritrite sunk in Ægean.
- 7.—R.A.F. sank supply ship off coast of Holland. Five Italian merchant ships captured at Kismayu, four scuttled ; German Uckermark sunk. Loss of H.M.S. Dainty announced.
- 8.—H.M. trawler Nadine shot down aircraft. H.M. submarine torpedoed and sank Italian Condottieri class cruiser. Loss of H.M. trawlers Remillo and Cobbers and Italian submarine announced.
- 9.—H.M.N.Z.S. Leander sank Italian raider Ramb I in Indian Ocean.
- 10.—H.M.S. Holderness shot down aircraft. Air attack on Portsmouth.
- 11.—H.M. submarine sank Italian transport.
- 12.—R.A.F. torpedoed destroyer in Skagerrak. Greek hospital ship attacked by Italian seaplane.
- 13.—H.M. trawler Milford Queen shot down aircraft. Loss of H.M. auxiliary vessel Manistee announced. Greek destroyer Psara sank Italian submarine in Ægean.
- 13-14.—R.A.F. attacked Bremerhaven ; liner Bremen set on fire.
- 16.—Loss of H.M. submarine Snapper announced.
- 18.—Prime Minister announced German battle-cruisers raiding in Western Atlantic. R.A.F. torpedoed and sank supply ship.
- 20.—H.M.S. Chico, yacht, and H.M. drifter Young Mun shot down aircraft. R.A.F. attacked E-boats and patrol ships off coast of Holland. H.M. submarine successes in Mediterranean announced : Triumph sank two supply ships ; Utmost, one or two ; and Unique, one.
- 21.—R.A.F. attacked tanker off coast of Belgium, supply ships off Frisian coast, in Heligoland Bight, off coast of Norway, and E-boats. Loss of H.M. trawlers Kerryado and Gulfoss announced. Air attack on Plymouth.

- 21-24.—Mediterranean Fleet operated south of Italy on convoy duty.
- 22.—R.A.F. attacked shipping at Brest and Quiberon ; escort ship hit.
- 23.—Loss of H.M. trawler Rubens announced. Greek submarine Triton sank Italian transport Carnia and damaged steamer off coast of Albania.
- 25.—H.M.S. Versatile shot down aircraft in North Sea. H.M.S. Shoreham intercepted German S.S. Oder escaping from Massawa.
- 26.—E-boat attacks on convoys in North Sea beaten off. H.M. submarine Sturgeon sank tanker off coast of Norway.
- 28.—Battle of Cape Matapan : cruisers Fiume, Pola and Zara and destroyers Vincenzo Gioberti, Vittorio Alfieri and Maestrale sunk.
- 28.—H.M. submarine Parthian torpedoed transport and tanker south of Italy. H.M.S. Leith shot down aircraft in Bristol Channel.
- 30.—R.A.F. attacked Scharnhorst and Gneisenau at Brest and shipping off coast of Holland and France ; anti-submarine ship sunk. French ships (4) escorted by destroyer passed through Straits of Gibraltar ; British intercepting naval forces fired on by French shore batteries and attacked by French bombers while returning to Gibraltar ; no damage.
- 31.—R.A.F. set two tankers on fire off coast of France and bombed destroyer off Frisian Islands.

APRIL.

- 1.—R.A.F. torpedoed ship off coast of Denmark.
- 2.—H.M.S. Lorna Doone shot down one and damaged another aircraft. R.A.F. sank one and hit another ship off coast of Holland. H.M. submarine sank Italian submarine and tanker Laura Corrado in Mediterranean. H.M.S. Kandahar intercepted German Bertram Rickmers. Italian destroyer Leoni sunk by air attack off Massawa.
- 3.—H.M.S. Locust shot down aircraft and damaged two others in Thames Estuary. R.A.F. attacked Scharnhorst and Gneisenau at Brest. Fleet Air Arm sank Italian destroyer off Massawa. Loss of H.M. auxiliary vessel Rosaura announced.
- 4.—R.A.F. attack two naval auxiliaries off west coast of France. Italian destroyers Pantera and Tigre scuttled in Red Sea.
- 5.—R.A.F. attacked Scharnhorst and Gneisenau at Brest ; torpedoed German destroyer off coast of France.
- 6.—H.M.S. Guillemot shot down aircraft attacking convoy. Loss of H.M.S. Wilna, yacht, announced.
- 8.—Massawa capitulated. Germans captured Salonika.
- 9.—H.M.S. Valorous, Avon Vale and Princess Elizabeth, and H.M. trawler Kingston Beryl shot down aircraft. Loss of H.M. trawlers Lord Selbourne and Craymond Island announced.
- 10.—Danish-American agreement to establish U.S. naval, military and air bases in Greenland.
- 11.—R.A.F. attacked shipping in North Sea, one patrol ship hit ; supply ship sunk off south coast of Norway.
- 12.—Raid on Ockfjord, near Hammerfest, Northern Norway, by party from Norwegian destroyer. Free French submarine chaser No. 41 shot down aircraft. Greek hospital ship Attiki sunk by German air attack.

- 13.—R.A.F. attacked shipping off coast of Holland and Germany ; supply ship sunk.
- 14.—H.M. trawler Kingston Amber shot down aircraft. R.A.F. attacked Scharnhorst and Gneisenau at Brest. Fleet Air Arm attacked Valona ; two ships blown up. Loss of H.M. trawler Fortuna announced.
- 15.—H.M. submarine Tigris sank armed tanker bound for occupied France. R.A.F. attacked three ships off north-west coast of France, two left sinking ; freighter off Borkum twice hit. British destroyers annihilated convoy of five ships between Sicily and Tripoli ; sank Italian destroyer Luca Tarigo and two others ; H.M.S. Mohawk, destroyer, sunk. Loss of H.M.S. Bonaventure, cruiser, announced.
- 17.—Bombardment of Fort Capuzzo.
- 18.—R.A.F. attacked convoy off coast of Norway ; one ship sunk, another set on fire.
- 18-19.—R.A.F. sank or damaged nine ships.
- 19.—British raiding force landed near Bardia.
- 20.—Loss of H.M.S. Torrent, yacht, also Australian trawler sunk by mine off coast of New South Wales, announced.
- 21.—H.M.S. Basset shot down two aircraft. R.A.F. attack on Scharnhorst and Gneisenau at Brest. Mediterranean Fleet bombarded Tripoli. H.M. submarine Tetrarch sank tanker en route to Tripoli. Greek hospital ships Hesperos sunk and Ellenis damaged by German air attack. Air attack on Plymouth.
- 23.—R.A.F. attacked Scharnhorst and Gneisenau at Brest ; shipping off coast of Holland ; three ships hit and probably sunk, others damaged. Loss of H.M.S. Rajputana, armed merchant cruiser, sunk by U-boat in Atlantic, announced. Air attack on Plymouth.
- 24.—H.M. submarine Urge sank tanker. R.A.F. sank tanker off coast of Norway. Withdrawal of British Forces from Greece began.
- 25.—R.A.F. sank ship in convoy west of Heligoland. Germans occupied Lemnos.
- 26.—R.A.F. attacked shipping off coast of Norway ; ship sunk, another in convoy off Frisian Islands damaged ; anti-aircraft ship attacked off coast of Holland. H.M. submarine Regent entered Kotor harbour, Yugo-slavia, to embark Mr. Campbell, British Minister.
- 27.—R.A.F. attacked two destroyers escorting convoy off coast of Holland ; one hit. H.M.S. Diamond and Wryneck sunk during withdrawal from Greece.
- 28.—H.M.S. Elgin shot down aircraft. R.A.F. attacked Scharnhorst and Gneisenau at Brest.
- 29.—R.A.F. attack on shipping off coasts of France, Belgium and Norway ; one supply ship set on fire, four severely damaged. Air attack on Plymouth.

MAY.

- 1.—R.A.F. attacked submarine base at Den Helder ; tanker damaged off coast of Holland. E-boat attack on British convoy from Greece ; no damage. Yugo-slav submarine Neboysca and two M.T.B.s arrived in British ports.
- 2.—R.A.F. attacked Scharnhorst and Gneisenau at Brest ; shipping in Dover Straits, two, probably three, ships sunk ; and Mediter-

- anean convoy; destroyer and three supply ships hit. Loss of H.M.S. *Voltaire*, armed merchant cruiser, announced.
- 4.—H.M.S. *Southwold* shot down aircraft. R.A.F. attacked shipping; patrol ship left sinking.
 - 5.—R.A.F. attacked *Scharnhorst* and *Gneisenau* at Brest.
 - 6.—R.A.F. attacked *Scharnhorst* and *Gneisenau* at Brest and shipping; one patrol ship sunk, another set on fire; supply ship sunk off Frisian Islands.
 - 7.—Loss of H.M. auxiliary vessel *Patia*, sunk by German aircraft which she shot down, announced.
 - 8.—R.A.F. attacked *Scharnhorst* and *Gneisenau* at Brest and shipping off coast of Norway; escort ship set on fire. *Benghazi* bombarded; two supply ships sunk. Loss of H.M.S. *Fiona*, yacht, announced.
 - 9.—German armed trawler *München* scuttled in northern waters. H.M.S. *Cornwall* sank German raider in Indian Ocean.
 - 10.—*Benghazi* bombarded.
 - 11.—H.M.A.S. *Canberra* and H.M.N.Z.S. *Leander* intercepted raider supply ship *Coburg* and tanker in Indian Ocean.
 - 12.—H.M.S. *Terror* and *Ladybird* sunk by air attack in Tobruk harbour. Loss of H.M. trawlers *Rochebonne* and *Kopanes* announced.
 - 12-13.—Fleet Air Arm attacked Italian convoy; supply ship blown up, destroyer damaged.
 - 13.—R.A.F. attacked *Heligoland* and shipping at *St. Nazaire*; one supply ship left sinking, another on fire. Loss of H.M.I.S. *Parvati* announced.
 - 14.—H.M.S. *Perspective* shot down aircraft. Germany announced mines laid in Red Sea.
 - 15.—R.A.F. attacked convoy off Frisian Islands; three supply ships set on fire.
 - 16.—R.A.F. attacked shipping off coast of Norway; one ship sunk, another damaged.
 - 18.—Loss of H.M. trawler *Susarion* and H.M. drifter *Uberty* announced. Egyptian S.S. *Zamzam* sunk by enemy raider.
 - 19.—H.M. trawlers *Tranio*, *Caswell*, *Thomas Leeds* and *Stella Leonis* shot down aircraft. Loss of H.M. auxiliary vessel *Camito* announced.
 - 20.—German air attack on *Crete* began.
 - 21.—German troop convoy for *Crete* destroyed. American S.S. *Robin Moor* sunk by U-boat.
 - 22.—French tanker *Scheherezade* bound for *Casablanca* intercepted in Atlantic. Loss of H.M. auxiliary vessel *Queensworth* announced. Italy admitted loss of submarine.
 - 23.—Submarine successes in Mediterranean announced: destroyer sunk, troopship, tanker and schooner destroyed, and schooner damaged.
 - 24.—H.M.S. *Hood* and *Prince of Wales* engaged German battleship *Bismarck* and cruiser *Prinz Eugen* in *Denmark Strait*; *Hood* blown up; aircraft from H.M.S. *Victorious* attacked *Bismarck* with torpedoes; one hit. R.A.F. set supply ship on fire off coast of Holland and damaged tanker off coast of France.
 - 25.—Loss of H.M.S. *Viva II*, yacht, announced.
 - 26.—R.A.F. flying boat sighted *Bismarck*, making for Brest; aircraft from H.M.S. *Ark Royal*, aircraft carrier, torpedoed her twice; during night destroyers *Cossack*, *Maori*, *Zulu* and Polish *Piorun* attacked with torpedoes; two hits. British gunboats attacked rebels up *River Tigris*, *Iraq*.

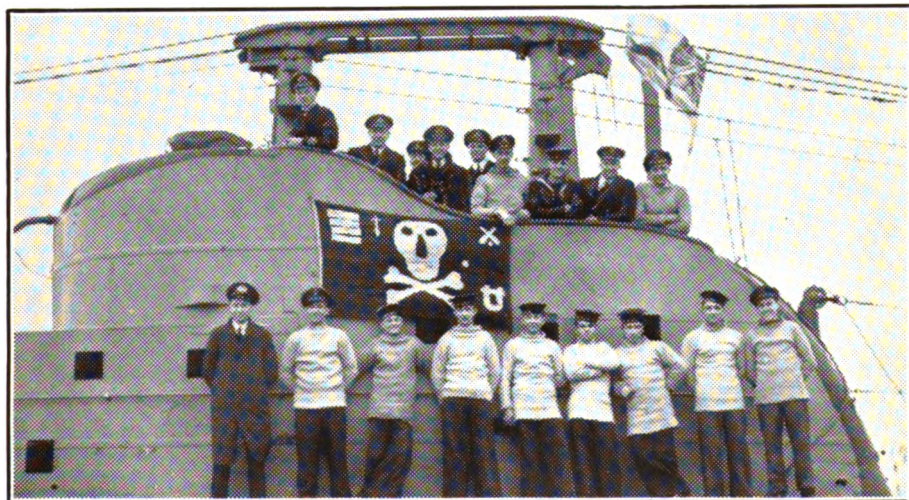
- 27.—Bismarck engaged and disabled by H.M.S. King George V and Rodney, and sunk by Dorsetshire's torpedoes. Prinz Eugen escaped to Brest. Withdrawal from Crete began.
- 27.—H.M.S. Gloucester, Fiji, Juno, Greyhound, Kelly and Kashmir sunk by air bombs during operations off Crete.
- 28.—Bismarck search forces attacked by aircraft; H.M.S. Mashona hit, subsequently sank. H.M. submarines in Mediterranean torpedoed and sank escorted transport and tanker, damaged another transport, supply ship and tanker en route to Libya. R.A.F. bombed Italian motor ship in Sfax harbour. Loss of H.M. submarine Usk announced.
- 29.—H.M.S. Tartar and H.M. trawler Chiltern shot down aircraft. German Lech intercepted en route from South America to occupied France. Loss of H.M.S. York by earlier air attack while under repair in Suda Bay, Crete, announced.
- 30.—H.M. submarine torpedoed transport Conte Rosso off Syracuse, Sicily.

JUNE.

- 1.—Withdrawal from Crete concluded.
- 4.—R.A.F. attacked supply ship off coast of Norway; set on fire.
- 5.—H.M. trawler Northern Sky shot down aircraft. Loss of H.M. trawler Ben Gairn and H.M. drifter Jewel announced.
- 6.—Three enemy ships and armed trawler announced sunk; former probably supply ships for Bismarck. Loss of H.M. submarine Undaunted announced.
- 7.—Air attack on convoy; H.M.S. Cottesmore shot down aircraft. R.A.F. attacked shipping: two supply ships set on fire off coast of Holland, others damaged; supply ship bombed off coast of Norway and salvage ship set on fire off Terschilling; Italian tanker sunk off Dardanelles.
- 8.—Loss of H.M. trawler Evesham and H.M. drifter Thistle announced.
- 9.—H.M.S. Blencathra shot down aircraft. Two more Bismarck supply ships announced sunk. British ships in action with French near Beirut. Loss of H.M.S. Calcutta, Hereward and Imperial during withdrawal from Crete announced.
- 10.—R.A.F. attacked Scharnhorst, Gneisenau and Prinz Eugen at Brest.
- 11.—R.A.F. attacked Ymuiden; small patrol ship sunk, also tanker in Straits of Dover. Indian troops, supported by R.A.F. and warships, captured Assab.
- 12.—R.A.F. torpedoed "pocket battleship" (believed Lützow) off south coast of Norway. R.A.F. attacked shipping in Channel: one ship left sinking; and convoy in Central Mediterranean: one ship sunk.
- 14.—Sixth Bismarck supply ship announced sunk. R.A.F. attack on Scharnhorst, Gneisenau and Prinz Eugen at Brest. Submarine successes in Mediterranean announced: two schooners and trawler escort sunk; tanker torpedoed; supply ship sunk at Lampedusa; armed merchant cruiser torpedoed at Benghazi; two schooners and supply ship sunk at Mitylene.
- 15.—R.A.F. attacked shipping; four ships damaged. Sidon fell after twenty-four hours' continuous naval bombardment; naval aircraft sinking French destroyer Le Chevalier Paul with torpedoes. Loss of H.M.S. Jersey by mine announced.



On the bridge of a British submarine on the surface at sea.
('The Times' photograph.)



H.M.S. Talisman, with her record of successes.
(British Official photograph.)

- 16.—Two French destroyers engaged off Beirut ; both damaged.
- 18.—Submarine successes in Mediterranean announced : tanker Guisepina Gherardi, three caiques and schooner sunk in Ægean ; two supply ships and auxiliary sailing ship sunk in Central area.
- 20.—H.M. trawler Capstone shot down aircraft. R.A.F. sank patrol ship off Den Helder.
- 22.—Germany invaded Russia. R.A.F. attacked shipping off west coast of France, ship damaged ; and shipping off Beirut, destroyer hit. Loss of H.M. trawler Sindonis and H.M. drifter M. A. West announced.
- 23.—Air attack on minesweepers ; H.M. trawler Solon shot down aircraft ; H.M. trawler Nogi bombed and subsequently sank. German supply ship Babitonga intercepted in Atlantic.
- 24.—H.M. submarines in Mediterranean sank supply ship and twice torpedoed liner.
- 25.—British convoy shot down aircraft. Naval aircraft probably sank German S.S. Elbe 900 miles north-west of Cape Verde Islands ; attacked convoy off south coast of Italy ; three ships damaged.
- 25.—British forces sank French submarine Souffleur off coast of Syria.
- 26.—Dutch submarine sank tanker and supply ship. Turkish Rifha sunk by unknown submarine.
- 27.—Loss of H.M.S. Grimsby announced.
- 28.—German Alstertor, supply and prison ship for raider, intercepted by destroyers and scuttled ; 78 British prisoners released.
- 29.—R.A.F. attack on convoy off island of Ameland ; anti-aircraft ship and two supply ships bombed, one set on fire. H.M. submarine sank cruiser Gorizia.
- 30.—Vessel (believed Dutch Maasdam) carrying U.S. Marines to London torpedoed (confirmed).

JULY.

- 1.—R.A.F. attacked Tripoli ; several ships hit. Loss of H.M.S. Pintail announced. Russia announced seven U-boats sunk in Baltic and Black Sea.
- 2.—German weather-reporting trawler intercepted north of Iceland. R.A.F. torpedoed supply ship in Channel.
- 4.—Naval aircraft sank French auxiliary vessel St. Didier off Turkish coast. R.A.F. attacked Tripoli ; two ships set on fire.
- 5.—Loss of H.M.A.S. Waterhen in Mediterranean announced.
- 6.—R.A.F. attacked patrol ships in North Sea : four sunk, four damaged. Submarine successes in Mediterranean announced : Italian armed merchant cruiser torpedoed and three supply ships sunk. R.A.F. attack Palermo ; three ships hit, fourth set on fire. Loss of H.M. trawlers Tranio and Resmilo announced. Russia announced two German destroyers sunk in Gulf of Riga and U-boat in minefield in Gulf of Finland.
- 7.—H.M.A.S. Parramatta shot down three aircraft. R.A.F. attacked convoy off coast of Holland, six ships hit ; convoy off Calais, one ship and E-boat sunk. Air attack on Southampton. U.S. naval forces' arrival in Iceland announced.
- 8.—Naval aircraft sank U-boat off Gibraltar (Spanish report).
- 9.—R.A.F. attacked Cherbourg and Le Havre ; six ships hit.
- 10.—Loss of H.M. trawlers Ash and Akranes announced. Vichy ships (23) fleeing from Beirut interned at Alexandretta.

- 11.—German S.S. *Hermes* intercepted, scuttled by crew. R.A.F. attacked minesweeper off coast of France ; set on fire.
- 12.—Dutch submarine sank tanker in Mediterranean. Russia announced two German destroyers, thirteen transports sunk, thirteen transports and destroyer set on fire in Baltic.
- 14.—Syrian armistice terms signed. Submarine successes in Mediterranean announced : tanker *Strombo* sunk ; supply ship sunk ; troop transport sunk in *Ægean* ; supply ship and armed trawler damaged by gunfire near *Benghazi*. R.A.F. attacked convoy off *Tripoli* ; two ships sunk. Loss of H.M.S. *Auckland* announced.
- 15.—R.A.F. defeated air attack on British shipping off coast of *Libya*. Russia announced U-boat and German trawler sunk by mines.
- 16.—R.A.F. attacked *Rotterdam* ; seventeen ships damaged ; supply ship off coast of France set on fire ; attacked convoy off *Tripolitania*, one ship sunk.
- 17.—R.A.F. attacked cruisers and destroyers at *Palermo* ; Fleet Air Arm bombed aerodromes at *Gerbini* and *Port Augusta*. Loss of H.M.S. *Lady Somers* announced. Russia announced U-boat sunk by mine in *Varanger Fjord*.
- 18.—R.A.F. attacked shipping off coast of France ; supply ship hit. Submarine successes in Mediterranean announced : one schooner and three caiques carrying German troops sunk ; schooner and two caiques destroyed ; supply ship, escorted by destroyers and aircraft, torpedoed.
- 19.—R.A.F. attacked shipping and enemy-occupied ports ; eight ships damaged.
- 20.—R.A.F. attacked anti-aircraft ship and tanker in Channel ; both severely damaged. Italians admitted loss of submarine in Atlantic. Russia announced eleven German transports and tanker sunk in Baltic.
- 22.—Convoy and escort in home waters shot down aircraft. R.A.F. and Fleet Air Arm attacked convoy off *Pantellaria* ; two ships sunk ; two others and destroyer damaged. Russia announced German destroyer, two transports and troopship sunk.
- 22.—Convoy in Mediterranean attacked at night by U-boat, U-boat probably sunk.
- 23.—Mediterranean convoy attacked by bombers and torpedo aircraft, several shot down ; H.M.S. *Fearless* torpedoed, later abandoned and sunk. R.A.F. attacked shipping off coast of France, one sunk, another damaged ; supply ship set on fire off coast of Norway ; day and night attack on *Scharnhorst* at *La Pallice*. Russia announced attack on German convoy in Baltic, ten ships sunk.
- 24.—Mediterranean convoy attacked by E-boats, one ship damaged but proceeded ; one E-boat sunk, one damaged ; more bomb and torpedo attacks, one cruiser and one destroyer damaged ; British light forces attacked convoy in *Dover Strait*, sank one patrol ship, damaged others.
- 26.—Italian motor-boat attack on *Valetta* harbour, *Malta* ; eight small craft and twelve E-boats sunk. Italians admitted loss of submarine. Russia announced naval aircraft destroyed two torpedo boats, U-boat and two transports in Baltic.
- 27.—German s.s. *Erlanger* intercepted in South Atlantic. Russian air attack on Finnish warships.

- 29.—R.A.F. defeated German air attack on British shipping off Cyrenaica ; attacked and damaged schooner in Central Mediterranean.
- 30.—Fleet Air Arm attack at Kirkenes, North Norway, and Petsamo, Finland ; sloop Bremse sunk, four supply ships hit ; four German aircraft shot down ; sixteen British lost.
- 31.—Russia announced air attack on two German patrol ships in Baltic ; one sunk, other severely damaged.
- 31—Aug. 1.—Fleet Air Arm attacked Italian convoy in Central Mediterranean ; one ship set on fire.

AUGUST.

- 1.—R.A.F. attacked shipping off coast of Belgium ; one ship set on fire ; intercepted air attack on warships off coast of North Africa. Destroyers bombarded aerodrome at Alghero and seaplane base at Porto Conte (Sardinia) ; aircraft from H.M.S. Ark Royal later attacked. Russia announced air attack on patrol ship and tanker in Baltic ; both sunk ; four other ships severely damaged ; submarine sank ammunition ship near Vardo, Norway.
- 3.—R.A.F. attacked tanker off Ostend ; set on fire. H.M. submarine torpedoed cruiser of Eugenio di Savoia class in Mediterranean ; two Italian supply ships torpedoed and sunk.
- 4.—German blockade runner s.s. Frankfurt intercepted. H.M. trawler Norland shot down aircraft. R.A.F. and S.A.A.F. attacked Derna and Benghazi ; enemy schooner sunk off Misurata. Loss of H.M.S. Snaefell announced.
- 5.—R.A.F. attacked three patrol ships off coast of Germany, all hit ; attacked convoy off coast of Holland, one ship hit.
- 6.—R.A.F. attacked two tankers in Channel ; one set on fire ; torpedoed ship off coast of Norway. Fleet Air Arm attacked Port Augusta, Sicily. Russia announced two German transports sunk by submarine.
- 6-7.—Fleet Air Arm attacked convoy off Lampedusa, two ships sunk ; next morning R.A.F. continued attack off coast of Tunis ; two ships hit, probably sunk.
- 8.—R.A.F. attacked Corinth Canal. Dutch submarine sank supply ship.
- 9.—H.M. minesweepers shot down aircraft. Fleet Air Arm torpedo attack on ship at Syracuse ; sunk.
- 10.—R.A.F. attacked shipping off coast of France ; one ship set on fire ; sank collier at Lampedusa. Fleet Air Arm attacked aerodromes at Catania and Gerbini. Loss of H.M.S. Defender announced.
- 11.—Russia announced four German torpedo boats, two transports sunk by Baltic Fleet.
- 13.—Fleet Air Arm attacked Port Augusta, Sicily. Russia announced German tanker sunk in Baltic.
- 14.—R.A.F. sank ship off Frisian Islands. Fleet Air Arm attacked convoy in Mediterranean ; destroyer and two ships sunk. Russia announced U-boat sunk in Baltic.
- 15.—Ships in Straits of Dover ineffectually shelled by Cape Gris Nez batteries. R.A.F. attacked two tankers and schooners off coast of Libya ; all hit, tankers sunk. Russia announced transport sunk by submarine.
- 16.—German S.S. Norderney and Italian S.S. Stella, blockade runners,

intercepted. "Fortress" aircraft bombed docks at Brest in daylight; R.A.F. set patrol ship on fire off coast of Holland. Dutch submarine sank supply and sailing ship in Mediterranean. Russia announced two Rumanian transports sunk by submarines in Black Sea.

- 16-17.—Fleet Air Arm attacked Syracuse; considerable damage to shipping.
- 17.—American S.S. Sessa sunk by U-boat in Atlantic.
- 17-18.—Fleet Air Arm attacked convoy in Central Mediterranean; one ship sunk, two set on fire.
- 18.—R.A.F. sank three patrol ships off coast of Holland. Loss of H.M. minesweeper No. 39 announced. Russia announced U-boat and two transports torpedoed.
- 19.—H.M. minesweepers shot down aircraft. R.A.F. attacked Ostend; many ships sunk. Loss of H.M. submarine Cachalot announced. Russia announced two German transports sunk by aircraft.
- 22.—Russia announced attack on convoy in Baltic; two transports and two E-boats sunk.
- 23.—R.A.F. attacked shipping in Gulf of Sirte; schooner and escort sunk, another schooner left sinking.
- 24.—H.M. trawler Brabant shot down aircraft. H.M. submarine attacked three Italian light cruisers and six destroyers; results not ascertained. R.A.F. defeated air attack on shipping in Mediterranean. Loss of H.M. submarine Union announced. Russia announced U-boat sunk in Black Sea.
- 25.—British and Indian troops landed in Iran with naval and air co-operation; eight German and Italian damaged ships captured at Bandar Shahpur.
- 26.—R.A.F. attacked convoys off Frisian Islands and coast of Holland; one ship and patrol ship sunk, others set on fire. Aircraft from H.M.S. Ark Royal attacked Sardinia. R.A.F. attacked shipping in Mediterranean; two ships hit. Loss of H.M.S. Picottee and Norwegian (ex-U.S.) destroyer Bath announced.
- 27.—British forces inflicted severe losses on Iranian Navy; two sloops damaged, four gunboats, depot ship and floating dock captured. Russian hospital ship Sibir sunk by air attack in Baltic.
- 27-28.—Fleet Air Arm attacked convoy in Mediterranean; one ship set on fire.
- 29-30.—R.A.F. attacked Tripoli; three ships set on fire.
- 30.—R.A.F. attacked shipping off coasts of France and Belgium; two anti-aircraft ships set on fire. Loss of H.M.S. Zinnia and H.M. trawler Thorbryn announced.

SEPTEMBER.

- 2.—R.A.F. attacked convoy off coast of Norway; two ships torpedoed; supply ship hit off Dunkirk. Russia announced raids by naval aircraft on Black Sea ports and enemy troops.
- 2-3.—Fleet Air Arm attacked convoy east of Cape Spartivento; one ship blown up, three damaged.
- 3.—Submarine successes in Mediterranean announced: two schooners sunk; shipping attacked off Sicily and Benghazi.
- 3-4.—Fleet Air Arm torpedoed and sank destroyer outside Tripoli.
- 4.—R.A.F. bombed tanker outside Granville, France. H.M.S. Hermione,

- cruiser, rammed Italian submarine. U.S. destroyer Greer attacked by U-boat ; torpedoes missed.
- 5.—Submarine successes in Mediterranean announced : cruiser severely damaged near Strait of Messina ; liner (possibly Duilio) and tanker sunk off Sicily ; supply ship in Central area and tanker Maya sunk off Tenedos, Dardanelles, en route to Istanbul.
 - 6-7.—Fleet Air Arm attacked convoy in Mediterranean ; two ships damaged.
 - 7.—R.A.F. attacked supply ship and escort off coast of Holland ; escort blown up, supply ship set on fire. H.M. submarine sank liner Esperia off Tripoli ; another submarine in Central Mediterranean attacked convoy, sank ship of Ramb class. Loss of H.M. submarine P. 33 announced. American S.S. Steel Seafarer sunk by aircraft in Red Sea. Russia announced U-boat captured in Barentz Sea.
 - 8.—Spitsbergen raided by British, Canadian and Norwegian force. British patrols attacked convoy in Channel ; one supply ship sunk, and probably another. U.570 surrendered to aircraft of Coastal Command ; towed into British port.
 - 9.—British naval forces attacked German convoys near Murmansk ; destroyer, armed trawler, and another ship sunk ; sloop Bremse also sunk.
 - 11.—R.A.F. sank ship in Ionian Sea. Loss of H.M.S. Tonbridge announced. American S.S. Montana (Panamanian flag) sunk by U-boat en route to Iceland. H.M.C.S. Chambley and Moose Jaw sank U.501 in North Atlantic.
 - 11-12.—Fleet Air Arm attacked convoy in Central Mediterranean ; one ship sunk, another damaged.
 - 12.—H.M.S. Vimiera shot down aircraft. Fleet Air Arm attacked shipping off coast of Norway ; one ship sunk, others damaged. R.A.F. attacked convoy off coast of Holland ; one ship set on fire.
 - 13.—R.A.F. attacked Scharnhorst and Gneisenau at Brest. Fleet Air Arm and R.A.F. attacked convoy in Central Mediterranean ; all six ships believed sunk. Russia announced warships, aircraft and coastal batteries had sunk four transports, one destroyer and damaged others. Atlantic convoys attacked ; three ships sunk by U-boats and five by aircraft (Germans claimed 28) ; one U-boat attacked by H.M.S. Deptford and Velox ; probably damaged. Dutch submarine sank supply ship in Mediterranean.
 - 14.—Russia announced two German destroyers sunk near Leningrad.
 - 15.—R.A.F. attacked convoy off Frisian Islands ; one ship left sinking, another damaged.
 - 16.—R.A.F. sank patrol ship off coast of Holland.
 - 17.—Loss of H.M. submarine P. 32 announced. Swedish destroyers Goteborg, Klas Horn and Klas Uggle sunk by explosion at Stockholm.
 - 18.—R.A.F. attacked four minesweepers off coast of Belgium, two sunk, another set on fire, and fourth left sinking ; two enemy anti-aircraft ships sunk and supply ship damaged. H.M. submarines attacked convoy in Mediterranean ; two liners sunk, third damaged.
 - 19.—Dutch submarine sank supply ship by torpedo and sailing ship by gunfire in Mediterranean. American S.S. Pink Star sunk by U-boat en route to Iceland. U.S. announced names of twelve British warships in American ports for repairs.

- 20.—R.A.F. attacked two convoys off coast of Holland, eight ships severely damaged and escort ship hit. E-boats attacked North Sea convoys, unsuccessfully; two damaged by escorts. Russia announced Finnish coast defence ship Ilmarinen sunk by mine in Gulf of Finland; submarine of Northern Fleet set transport on fire.
- 22.—German air attack on two Norwegian steamers trying to escape to sea; both sunk.
- 23.—R.A.F. and Fleet Air Arm attacked three ships in Central Mediterranean; all severely damaged: R.A.F. attack on Benghazi; one ship exploded.
- 24.—Submarine successes in Mediterranean announced: transport, minelayer, schooner sunk; supply ship set on fire. Russia announced transport sunk in Gulf of Finland.
- 26.—R.A.F. attacked shipping; patrol ship sunk off Cherbourg; two anti-aircraft ships damaged; two minesweepers set on fire off Dunkirk; attacked convoy off Tripoli; one ship sunk, others damaged. Loss of H.M. trawlers Skudd III and Strathborve announced.
- 27.—Important convoy passed through Central Mediterranean; aircraft damaged ship which had to be sunk; torpedoed H.M.S. Nelson, speed slightly reduced, but no casualties. R.A.F. attacked ship in Gulf of Taranto; set on fire and left sinking. Loss of H.M.C.S. Levis announced. U.S.-owned tanker I. C. White (Panamanian flag) torpedoed 450 miles east of Pernambuco.
- 28.—Light forces from Western Mediterranean Squadron bombarded Pantellaria. Russia announced Northern Fleet sank two transports; Baltic Fleet, with coastal batteries, sank German cruiser and two torpedo boats, damaging a third.
- 29.—R.A.F. attacked shipping off coast of Belgium; patrol ship set on fire, others damaged.
- 30.—R.A.F. attacked shipping off coast of Holland; two ships damaged; ship torpedoed off south coast of Norway; another set on fire off Cherbourg.

OCTOBER.

- 2.—R.A.F. attacked shipping; barge set on fire off Dunkirk; two motor ships bombed in Norwegian waters.
- 3.—R.A.F. attacked shipping off Gravelines; one anti-aircraft ship sunk, three set on fire and three damaged; supply ship also set on fire. Russia announced U-boat sunk off North Coast.
- 4.—German supply ship sunk in Atlantic.
- 5.—Fleet Air Arm attacked convoy in Ionian Sea; two ships sunk, another damaged. R.A.F. attacked shipping at Tripoli; oil tanker set on fire.
- 6.—French liner Theophile Gautier sunk by unknown submarine in Aegean.
- 7.—Submarine successes in Mediterranean announced; torpedo boat, guard, supply and sailing ship sunk; two tankers, two transports and three supply ships severely damaged.
- 8.—Fleet Air Arm attacked shipping off coast of Norway; supply ship set on fire, three others hit. Loss of H.M.S. Corfield announced.
- 8-9.—Fleet Air Arm sank ship and R.A.F. damaged another in Mediterranean.

- 9.—H.M. trawler *Lady Shirley* engaged U-boat which surrendered.
- 10.—Further successes by Fleet Air Arm against German supply ships for North Russia announced.
- 10-11.—R.A.F. and Fleet Air Arm attacked convoy in Central Mediterranean ; three ships torpedoed and others damaged.
- 11.—R.A.F. attacked shipping in Gulf of Sirte ; two ships set on fire.
- 12.—Loss of Dutch minelayers *Van Meerlaut*, *Caroline* and *Nautilus* announced. U.S. warship captured German party attempting to establish wireless station in Greenland.
- 13-14.—Fleet Air Arm attacked convoy in Central Mediterranean ; ship set on fire.
- 14.—H.M. submarines sank three and Dutch submarines one supply ship in Mediterranean.
- 15.—Russia announced since beginning of campaign 60 enemy warships and 156 transports and other ships sunk in Baltic.
- 16.—Australian Navy announced passages in Great Barrier Reef mined. Two reconditioned U.S. submarines transferred to Great Britain.
- 17.—Loss of H.M.S. *Fleur de Lys* announced. U.S. destroyer *Kearny* torpedoed by U-boat south-west of Iceland ; survived.
- 17-18.—Fleet Air Arm attacked convoy in Central Mediterranean ; three ships hit.
- 19.—Loss of Dutch escort ship announced. American S.S. *Lehigh* torpedoed and sunk off west coast of Africa.
- 20.—Russia announced operations of battleship *Oktober Revolution* against German Army in Baltic.
- 21.—Two Italian torpedo boats sunk in Central Mediterranean ; probably by mines. U.S. announced names of three more H.M. ships repairing in American ports.
- 22.—Submarine successes in Mediterranean announced : two ships torpedoed, one sunk ; another submarine bombarded aerodrome at Appollonia, Cyrenaica.
- 23.—Loss of H.M.S. *Springbank* announced.
- 24.—H.M. submarine torpedoed, probably sank, armed merchant cruiser *Citta di Genova* in Central Mediterranean. Loss of H.M.S. *Broadwater* (ex-U.S. destroyer) by U-boat in Atlantic announced.
- 25.—R.A.F. attacked ships off Terschelling ; two hit ; ships off Ymuiden set on fire.
- 29.—R.A.F. attack at Aalesund, Norway : seven ships hit, two sunk. Loss of H.M. trawlers *Emilion* and *Kos 21* announced. U.S. destroyer *Reuben James* sunk by U-boat west of Iceland.
- 30.—R.A.F. attacked E-boats off coast of Holland ; one sunk, another damaged.
- 31.—R.A.F. attacked shipping off coast of France ; three ships set on fire ; eleven ships, including tanker, supply ship and escort ship, hit off coast of Norway and Frisian Islands ; anti-aircraft ship sunk off coast of France. British ship claimed to have sunk submarine which damaged her.

NOVEMBER.

- 1.—R.A.F. attacked convoy off Frisian Islands ; one ship blew up, another set on fire ; ship torpedoed off La Pallice ; ship hit in Mediterranean.
- 2.—R.A.F. attacked shipping off Dutch Islands and coast of Norway ;

- tanker and supply ship hit, ship set on fire. British forces in co-operation with South African forces intercepted Vichy convoy off South Africa.
- 3.—Supply ship in Channel intercepted by our patrols : ship damaged, probably sunk, patrol ship damaged by enemy escort.
 - 5.—Air attack on Irish Glencree off English coast. R.A.F. attacked convoy off Frisian Islands ; one ship set on fire. H.M. submarines sank three supply ships in Central Mediterranean.
 - 6.—H.M.S. Cossack sunk. Loss of H.M.S. Gladiolus announced. Italian tanker Torcello sunk in Black Sea ; presumably by Soviet submarine. U.S. seized German motor ship Odenwald in South Atlantic.
 - 8.—Spanish S.S. Castillo Oropesa sunk by unknown submarine in territorial waters off Melilla, Spanish Morocco. Turkish motor ship Kaynakdere sunk in Black Sea territorial waters by unknown submarine.
 - 9.—Two cruisers and destroyers destroyed Italian convoy of ten supply ships and sank two escorting destroyers in Central Mediterranean ; H.M. submarine later sank a third.
 - 10.—H.M.S. Quantock shot down aircraft which attacked convoy in North Sea.
 - 11.—R.A.F. sank supply ship off coast of Holland. Submarine successes in Mediterranean announced : four supply ships and two sailing ships sunk ; two armed merchant cruisers and two supply ships severely damaged.
 - 12.—Loss of H.M. trawler Francolin, after shooting down aircraft, announced.
 - 14.—H.M.S. Ark Royal torpedoed east of Gibraltar ; sank following morning.
 - 16.—H.M.S. Marigold sank U. 483 in Western Mediterranean.
 - 17.—Dutch air attack on supply ship off south-west coast of Norway ; hit scored.
 - 18.—British offensive in Libya began ; British naval forces bombarded Halfaya.
 - 19.—H.M.S. Prince of Wales reported at Capetown. H.M.A.S. Sydney sank raider Steiermark 300 miles off Western Australia ; Sydney torpedoed and blew up.
 - 20.—E-boat (6) action off East Coast ; one sunk, others severely damaged ; R.A.F. sank one and damaged another. Submarine successes in Mediterranean announced : tanker Tampico torpedoed and severely damaged ; supply ship sunk ; one escort hit and schooner set on fire by gunfire. Loss of H.M.S. Latona announced.
 - 21-22.—R.A.F. and naval aircraft attacked convoy in Central Mediterranean escorted by cruiser and five destroyers ; cruiser hit, destroyer probably sunk ; two supply ships torpedoed.
 - 22.—H.M.S. Devonshire sank armed merchant raider, apparently U-boat supply ship, in South Atlantic.
 - 24.—British forces sank two ships in Central Mediterranean.
 - 27.—R.A.F. attacked supply ship off the Hague, left sinking ; attacked convoy near coast of Normandy ; supply ship and two anti-aircraft ships sunk.
 - 28.—Russia announced German tanker and five transports sunk by submarines.
 - 28.—Dutch submarine sank U. 95 in Mediterranean.

- 29.—Submarine successes in Arctic announced : H.M.S. Tigris sank five ships and damaged another : H.M.S. Trident sank two transports, one supply ship and damaged four others ; eight ships attacked and damaged by gunfire.

DECEMBER.

- 1.—H.M.S. Mendip shot down aircraft off East Coast. H.M.S. Aurora and light forces sank destroyer Alvis Da Mosta, supply ship Adriatico and tanker Mantovani in Central Mediterranean. R.A.F. attacked tanker in Central Mediterranean, damaged ; subsequently sunk by naval forces
- 2.—H.M.S. Prince of Wales, Repulse and other ships of Eastern Fleet arrived at Singapore. Greek submarine Glaukos sank supply ship off Crete.
- 3.—R.A.F. attack on supply ship off coast of Norway ; set on fire.
- 6.—H.M.S. Dorsetshire sank armed merchant raider, apparently U-boat supply ship, in South Atlantic.
- 7.—H.M.S. Peterel, gunboat, sunk by Japanese cruiser Idzumo, and U.S. gunboat Wake captured, at Shanghai. Japanese attacked Pearl Harbour, Hawaii ; U.S. battleship Arizona, three destroyers, mine-layer and target ship sunk ; battleship Oklahoma damaged and capsized.
- 8.—R.A.F. set supply ship on fire off coast of Holland. Loss of H.M.C.S. Windflower announced. U.S. announced transports General Hugh Scott and President Harrison sunk or captured in Pacific. Wake Island attacked by Japanese aircraft. Japanese battleship Haruna sunk by U.S. aircraft off north coast of Luzon.
- 9.—French St. Denis sunk off Balearic Island by U-boat.
- 9.—Japanese landed in Philippines ; six Japanese transports attacked by U.S. aircraft ; five damaged, one sunk.
10. H.M.S. Prince of Wales and Repulse sunk by Japanese naval aircraft off Malaya. Japanese landed in Guam.
- 11.—Japanese attempt to land on Wake Island repulsed. One cruiser, two destroyers, one gunboat and one submarine sunk. American S.S. Lahama shelled and sunk by submarine in Pacific.
- 12.—H.M. submarine attack on three cruisers screened by destroyers in Central Mediterranean ; three hits scored with torpedoes, cruiser probably sunk. U.S. seized French liner Normandie.
- 13.—British destroyers Sikh, Legion, Maori and Dutch Isaac Sweers attacked two Italian cruisers, torpedo boat and E-boat in Central Mediterranean ; both cruisers and E-boat sunk ; torpedo boat severely damaged.
- 13.—Dutch submarine sank four Japanese transports off southern Thailand. U.S. aircraft sank four troopships and damaged three.
- 14.—Loss of H.M. trawlers Phineas Beard and Milford Earl announced. Dutch Naval Air Service blew up supply ship off coast of Norway. Japanese captured Guam.
- 15.—Submarine successes in Mediterranean announced : supply ship, schooner and caique sunk by gunfire, supply ship and salvage tug torpedoed and sunk in Candia harbour ; transport probably sunk. Loss of H.M. submarine Tetrarch announced. Norwegian ship sunk while approaching Hawaiian Islands. Spanish Badalona sunk by U-boat off Malaga, Spain.

- 15-16.—R.A.F. attacked naval forces in Taranto harbour.
- 16.—R.A.F. torpedoed and probably sank anti-aircraft ship off coast of Holland. Fleet Air Arm torpedoed ship in Central Mediterranean ; believed sunk.
- 17.—H.M.S. Farndale sank Italian submarine Ammiraglio Caracciolo in Mediterranean.
- 17.—R.A.F. attacked Scharnhorst and Gneisenau at Brest ; hit reported. H.M.S. Dunedin sunk by U-boat in Atlantic.
- 18.—Dutch naval aircraft set Japanese cruiser on fire at Miri, Sarawak. H.M.S. Stanley sunk by U-boat while defending convoy. U.S. submarines sank Japanese transport and probably destroyer.
- 20.—Russian s.s. Perekop attacked by Japanese aircraft in Dutch East Indies ; eight men killed. Japanese captured Wake Island.
- 21.—Loss of H.M.S. Banka in Pacific announced. H.M.S. Audacity sunk by U-boat while defending convoy—claimed by German as H.M.S. Formidable. Dutch aircraft hit two Japanese cruisers off Miri. Colonel Knox announced fourteen U-boats already sunk in Atlantic by U.S. Navy.
- 22.—H.M.S. Duke of York arrived in U.S.A., conveying Prime Minister. R.A.F. attacked tanker and supply ship off coast of Norway ; both hit. M.T.B.s destroyed two enemy ships off Hong Kong. U.S. tanker attacked by submarine north of Santa Barbara ; torpedoes missed.
- 23.—H.M. submarines sank six transports and supply ships in Mediterranean announced. Free French force occupied islands of St. Pierre and Miquelon, off Newfoundland. American S.S. Montabello sunk and Larry Doheny shelled by U-boat off California. R.A.F. torpedoed German tanker off coast of Spain.
- 25.—Hong Kong surrendered.
- 26.—Lofoten Islands raided.
- 27.—Raid on Norwegian coast, Vaagso ; nine ships destroyed.
- 28.—Convoy shot down aircraft. Loss of H.M.S. Rosabelle and Chakdina announced.
- 29.—Australian aircraft set Japanese cruiser on fire north of Celebes.
- 31.—H.M. submarines sank five schooners and torpedoed destroyer in Central Mediterranean announced.

BRITISH AND FOREIGN NAVIES.

PRINCIPAL OFFICIALS.

On January 1, 1942.

GREAT BRITAIN.

*Board of Admiralty.**First Lord.*—The Right Honourable A. V. Alexander, C.H., M.P.*First Sea Lord and Chief of Naval Staff.*—Admiral of the Fleet Sir Dudley Pound, G.C.B., G.C.V.O.*Second Sea Lord and Chief of Naval Personnel.*—Vice-Admiral Sir W. J. Whitworth, K.C.B., D.S.O.*Third Sea Lord and Controller of the Navy.*—Vice-Admiral Sir Bruce A. Fraser, K.B.E., C.B.*Fourth Sea Lord and Chief of Supplies and Transport.*—Vice-Admiral Sir John H. D. Cunningham, K.C.B., M.V.O.*Fifth Sea Lord and Chief of Naval Air Services.*—Rear-Admiral Arthur St. G. Lyster, C.B., C.V.O., D.S.O.*Vice-Chief of Naval Staff.*—Vice-Admiral Henry R. Moore, C.B., C.V.O., D.S.O.*Assistant Chiefs of Naval Staff.*—Vice-Admiral Edward L. S. King, C.B., M.V.O.*Parliamentary and Financial Secretary.*—Sir Victor Warrender, Bart., M.C., M.P.*Civil Lord.*—Captain Austin Hudson, M.P.*Controller of Merchant Shipbuilding.*—Sir James Lithgow, Bart., M.C.*Permanent Secretary.*—Sir Henry V. Markham, K.C.B., M.C.

FOREIGN POWERS.

Country.	Minister of Marine.	Chief of Staff.
Argentina. . . .	Rear-Admiral Mario Fincati	—
Brazil.	Vice-Admiral Henrique Aristides Gullenhem	Vice-Admiral J. M. Castro e Silva
Chile.	Don Emilio Bello Codecido (Minister of National Defence), Vice-Admiral Julio Allard (Director General of the Navy)	—
China.	Admiral Chen Shao-Kwan (Minister of Naval Affairs)	Vice-Admiral Chen Hsueh-Yung (Vice Minister)
Colombia. . . .	—	—
Cuba.	—	—
Denmark. . . .	Vice-Admiral H. Rechnittzer (Chief of Naval Defence and Director of the Naval Ministry)	Commodore C. Hammerich
Ecuador. . . .	Colonel Benigno Andrade Flores (Minister of Defence)	General Enrique Bariga (Commanding Naval Forces)
Finland. . . .	J. Niukkanen (Minister of Defence)	Rear-Admiral Lundmann
France.	Amiral de la Flotte J. L. X. F. Darlan.	—
Germany. . . .	Adolf Hitler (Supreme Commander of the Armed Forces)	General-Admiral Dr. Raeder (Commander-in-Chief of the Navy)
Greece.	Vice-Admiral A. Sakellariou	Rear-Admiral E. Cawadias
Hungary. . . .	Rear-Admiral O. R. Wulff (Inspector General)	—
Italy.	Signor Benito Mussolini	Ammiraglio Arturo Riccardi
Japan.	Admiral Shimada	Admiral Nagano
Mexico.	General Quiroga (Minister of War and Marine)	Rear-Admiral O. P. Blanco
Netherlands. .	Vice-Admiral J. T. Fürstner (Minister for Naval Affairs)	Rear-Admiral J. W. Termijtelen
Norway.	Mr. Oscar Torp (Minister of Defence)	Rear-Admiral E. Corneliusen (C.-in-C.)
Paraguay. . . .	Commander D. Manuel Aponte (Director of Marine Dept.)	Lieut.-Commander Ramon Martino (Director General of the Navy)
Peru.	Captain Roque Salias (Minister of Marine and Aviation)	Captain Fredrico Diaz Dulanto
Poland.	Rear-Admiral J. Swirski (Chief of Polish Navy)	—
Portugal. . . .	Lieut.-Commander M. O. Bettencourt	Vice-Admiral J. A da Matta Oliveira
Rumania. . . .	—	Rear-Admiral I. Georgescu
Soviet Union. .	Admiral Kuznetsoff (People's Commissar)	Admiral Isakov
Spain.	Admiral Moreno	Admiral Moreu (Admiral Secretary-General)
		Admiral Estrada (C.-in-C. Naval Forces)
Sweden.	T. E. Sköld (Secretary of State for Swedish Defence Forces)	Admiral C. F. Tamm

Country.	Minister of Marine.	Chief of Staff.
Thailand . . .	Luang Bipul (Minister of Defence)	Rear-Admiral Luang Sindhu
Turkey . . .	Rear-Admiral H. Gomdabay (Under-Secretary for the Navy)	Commodore I. Ozel
United States .	Colonel Knox (Secretary of the Navy)	Admiral Harold R. Stark (Chief of Naval Operations)
Uruguay . . .	General Julio Cesar Rolotti (Minister of War and Marine)	Captain Gustavo Schroeder (Inspector General of Marine)
Venezuela . .	Commander Lavazaval (Head of the Navy)	—
Yugoslavia . .	Army General Minallovic (War Minister)	Captain Kern (Commanding at Alexandria)

BRITISH AND FOREIGN NAVAL ATTACHÉS.

On January 1, 1942.

BRITISH NAVAL ATTACHÉS ACCREDITED TO FOREIGN COUNTRIES.

To.	Name.	Appointed.	Headquarters.
Argentina, Uruguay .	Rear-Adml. J. S. C. Salmond Assistant, Commander Lloyd Hurst	March, 1940	Buenos Aires.
Brazil, Venezuela .	Captain Amcot Wilson . Assistant, Lieutenant-Com- mander C. H. Pullen, R.N.V.R.	1940	Rio de Janeiro.
Chile, Peru, Ecuador, and Colombia . .	Captain A. Domville . . Assistant, Lieutenant-Com- mander R. V. Vaughan, R.N.V.R.	1940	Santiago.
Portugal	Captain H. D. Owen . . Assistant, Lieutenant C. D. Fini, R.N.V.R.	Sept. 3, 1939 Oct. 8, 1938	Lisbon.
Spain	Captain A. H. Hillgarth, O.B.E. Assistants, Lieutenant D. R. Ison, R.N.V.R. Lieutenant G. Beare, R.N.V.R.	Jan., 1942 Aug. 30, 1939 Jan., 1942	Madrid. ,,
Sweden	Captain H. M. Denham . .	Nov., 1939	Stockholm.
Turkey	Captain G. E. M. O'Donnell, D.S.O.	May 25, 1940 July 6, 1939	Ankara.
U.S.A., Mexico, Panama, Cuba . .	Rear-Admiral H. Pott, M.V.O.	June, 1940	Washington.
U.S.S.R.	Captain H. Clanchy . . .	Oct. 24, 1936	Moscow.

FOREIGN NAVAL ATTACHÉS ACCREDITED TO GREAT BRITAIN.

Argentina : Commander Alberto Job.
 China : Captain Lung Yung Hsien (deceased), Lieutenant-Colonel Chen Pin Kai is
 acting till arrival of new Attaché.
 France : Vice-Admiral E. H. D. Muselier (Commander of Free French Navy).
 Greece : Captain C. Alexandris.
 Netherlands : Lieut.-Commander A. de Booy, O.B.E.
 Norway : Captain J. E. Jacobsen, O.B.E..
 Poland : Commander Tadewsz Stoklasa.
 Sweden : Captain N. J. Wesström.
 Thailand : Colonel Mom Snidvongse Senni.
 Turkey : Commander Siret Cakir.
 United States : Captain C. A. Lockwood, Junr., U.S.N.
 Yugoslavia : General (of Division) Milorad Radović.
 Spain : Captain Don Rafall Espinosa de los Monteros.
 U.S.S.R. : Rear-Admiral N. Kharlamov.

PICTORIAL SECTION

SILHOUETTES OF WARSHIPS

CAPITAL SHIPS.

[In order to facilitate identification, the ships are arranged in accordance with the number of funnels and masts, as these are the features most easily distinguished at a distance. Dimensions and particulars of British and foreign warships will be found on pp. 185-282. All the profiles are drawn to the scale $\frac{1}{4}$ in. = 100 ft.]

[An Index to the names of vessels of which profiles are included in this section are given at the end of the volume.]



SWEDEN. Battleship. Oscar II.
(A searchlight is fitted on each mast.)



UNITED STATES. Battleships. Washington, North Carolina.



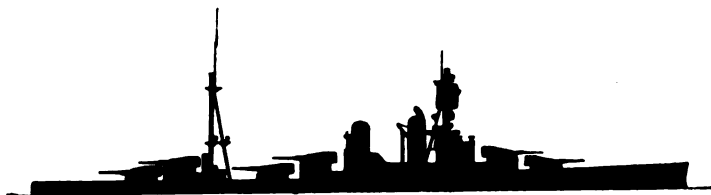
GREAT BRITAIN. Battle-cruiser. Renown.
Forward superstructure modified.
Fore topmast and topgallant mast fitted.
The after funnel is the same size as forward funnel.
Tripod mainmast replaced by polemast, and main topgallant mast removed.



GREAT BRITAIN. Battleships. King George V., Duke of York, Howe, Anson.



JAPAN. Battleships. Mutsu, Nagato.
Single funnel fitted and catapult added between mainmast and "X" turret.
Superstructure built round mainmast.
Bridgework modified.
Main topgallant mast removed.



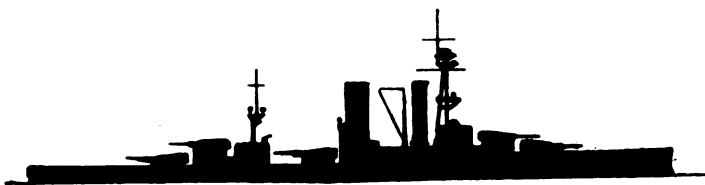
JAPAN. Battleships. Ise, Hyuga.

Fore funnel and topmast removed.
Bridgework modified.
Superstructure built round mainmast.
Main topgallant mast removed.



JAPAN. Battleships. Kirishima, Kongo.

Kongo has funnels of equal height.
Derricks fitted between X and Y turrets.



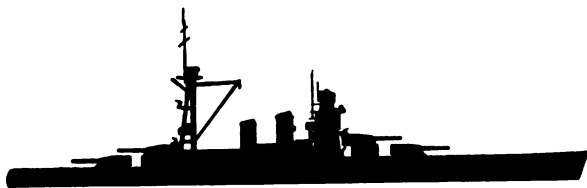
CHILE. Battleship. Almirante Latorre.

(Modernised 1931—mainmast raised and bridge work altered.)
Catapult fitted on quarter deck.



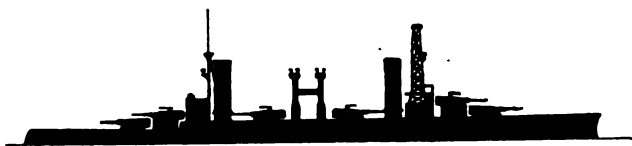
UNITED STATES. Battleships. California, Colorado, Maryland, Tennessee, West Virginia.

(Now fitted with 2 catapults, one on "X" turret and one on the quarter deck.
Crane fitted at stern.
Maryland has range-finder fitted on B turret.



ITALY. Battleships. Conte di Cavour, Giulio Cesare, Andrea Doria, Carlo Duilio.

Tripod mainmast removed in Doria.



ARGENTINA. Battleships. Moreno, Rivadavia.
Guns on B and X turrets replaced by range-finders.



FRANCE. Battleships. Bretagne, Lorraine, Provence.
NOTE.—Lorraine has been modernised. The midships turret has been removed and replaced by a hangar and catapult. Cranes fitted abreast after funnel. Bridgework extended. Fore topmasts removed, main topmasts fitted.



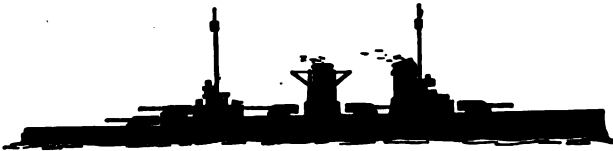
FRANCE. Battleships. Courbet, Paris (operated by the Free French).
Cranes fitted abreast after funnel.
After funnel reduced in height.
Range-finder fitted on B turret.



BRAZIL. Battleships. Minas Geraes, São Paulo.
Forward funnel removed and bridgework modified.
Remaining funnel made larger.
Polemast and range-finder fitted abaft funnel.



SOVIET UNION. Battleships. Marat, Paris Commune and October Revolution.
Two derricks fitted between mainmast and turret in Marat and Paris Commune.
Crane fitted abreast mainmast in October Revolution.



TURKEY. Battle-cruiser. Yavuz Sultan Selim.



GREAT BRITAIN. Battleships. Nelson, Rodney.

Nelson has a crane amidships.
Rodney has a catapult fitted on C turret.
Mast structure increased.



FRANCE. Battleships. Dunkerque, Strasbourg.

Catapult fitted on quarter deck. Crane is moved aft to break of deck.
Main topgallant mast fitted.



JAPAN. Battleships. Fuso and Yamashiro.

(After reconstruction, 1934.)
A.A. guns fitted abreast mainmast.



GREAT BRITAIN. Battleship. Malaya.

NOTE.—Catapult fitted before mainmast; Derrick on mainmast removed
Hangar and cranes fitted abreast funnel.



GREAT BRITAIN. Battleships. Warspite, Queen Elizabeth, Valiant.
Sternwalks fitted in Warspite and Queen Elizabeth.



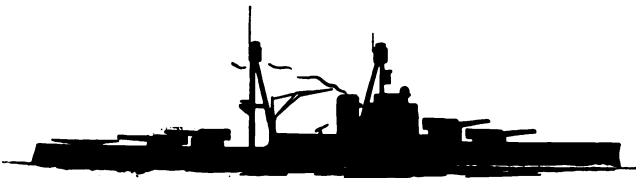
UNITED STATES. Battleships. New York, Texas.
Fore topmast removed; Mastheads modified and fitted with machine-guns.
Range-finder fitted on B and X turrets.



GREAT BRITAIN. Battleships. Ramillies, Resolution, Revenge, Royal Sovereign.
Note.—Resolution has a smoke deflector on the funnel. Ramillies and Resolution
have tripod mainmasts, a catapult on "X" turret and a crane abreast
mainmast.
Main topgallant mast fitted. Fore topmast removed.



UNITED STATES. Battleships. Idaho, Mississippi, New Mexico.
(After modernisation, 1934.)



UNITED STATES. Battleship. Pennsylvania.
Catapult on "X" turret added. Crane fitted at stern. Main topmast is on fore
side of mast structure.

CAPITAL SHIPS.



UNITED STATES. Battleships. Nevada, Oklahoma.
Bridgework extended and mastheads modified.



UNITED STATES. Battleship. Arkansas.



GERMANY. Armoured Ship. Admiral Scheer.



GERMANY. Armoured Ship. Lutzow (ex-Deutschland).
Polemast fitted on aft side of funnel. Catapult fitted abaft funnel.
Fore topmast fitted.
Polemast fitted on after superstructure.
Cranes fitted in lieu of derricks.



GERMANY. Battle Cruisers. Scharnhorst, Gneisenau
Gneisenau has a vertical stempiece.

AIRCRAFT AND SEAPLANE CARRIERS AND TENDERS.



GREAT BRITAIN. Aircraft Carrier. Eagle.
Fore topmast added and mast structure modified.
Signal mast added forward.



GREAT BRITAIN. Aircraft Carrier. Hermes.
Topmast and signal mast forward added. Flight deck extended aft.



GREAT BRITAIN. Aircraft Carrier. Argus. (Training Ship.)
Flight deck levelled forward and extended aft.



GREAT BRITAIN. Aircraft Carrier. Furious.
Three wireless masts added each side of flight deck.
Quarter deck has been raised one deck.
Deck forward has been levelled and sides blanked off.
Superstructure, polemast and spotting top fitted amidships.



GREAT BRITAIN. Aircraft Carriers. Illustrious, Victorious, Formidable, Indomitable.



FRANCE. Aircraft Carrier. Béarn.

Space between flight deck and upper deck forward partially blanked off.
Framework fitted on aft side of funnel.



UNITED STATES. Aircraft Tender. Langley.

Foremost third of flight deck removed.
Two pole masts fitted.
Bridge and Derricks fitted forward.



UNITED STATES. Aircraft Carriers. Saratoga, Lexington.
Lexington has platform round top of funnel.



UNITED STATES. Aircraft Carrier. Ranger.

(NOTE.—Funnels hinge outboard.)
Signal masts fitted at ends of flight deck.



UNITED STATES. Aircraft Carriers. Enterprise, Yorktown, Hornet.



JAPAN. Aircraft Carrier. Hosho.
Funnels hinge outboard.



JAPAN. Aircraft Carrier. Akagi.
Superstructure added and flight deck extended forward.



JAPAN. Aircraft Carrier. Kaga.
Superstructure added and flight deck extended forward.



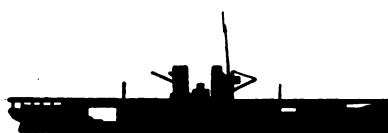
JAPAN. Aircraft Carrier. Ryujo.



JAPAN. Aircraft Carriers. Soryu, Hiryu, Koryu



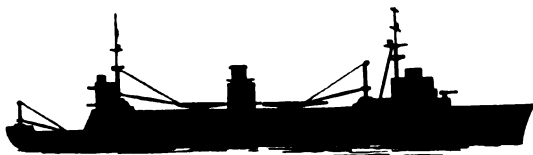
SWEDEN. Aircraft Cruiser. Gotland.



ITALY. Seaplane Carrier. Miraglio.



GREAT BRITAIN. Seaplane Carrier. Albatross.
Catapult fitted forward.



FRANCE. Aviation Transport. Commandant Teste.



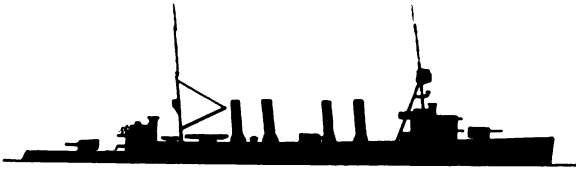
JAPAN. Seaplane Carrier. Notoro.

CRUISERS AND COAST DEFENCE SHIPS.



JAPAN. Cruisers. ("Sendai" class.) Naka, Sendai, Jintsu.

Catapult fitted abaft mainmast. Aircraft platform forward removed.
The mainmast is of tripod construction and is fitted with a derrick on its after side.



UNITED STATES. Scout Cruisers. ("Omaha" class.) Cincinnati, Concord, Detroit, Marblehead, Memphis, Milwaukee, Omaha, Raleigh, Richmond, Trenton.

There are small differences in the arrangement of guns aft.
Topmasts shortened.



ROYAL AUSTRALIAN NAVY. Cruiser. Adelaide.

Forward funnel removed and superstructure modified.



ITALY. Light Cruiser. Taranto (ex-German Strassburg).



GREAT BRITAIN. Cruisers. ("London" class.) Devonshire, London, Shropshire, Sussex. ("Norfolk" class.) Dorsetshire, Norfolk.
Fore topgallant mast added.

CRUISERS.



GREAT BRITAIN. Cruisers. ("Kent" class.) Cumberland, Suffolk, Kent, Berwick, Cornwall.

Kent has a sternwalk.

Kent, Berwick and Cornwall are flush-decked.

ROYAL AUSTRALIAN NAVY. Cruisers. ("Kent" class.) Australia, Canberra.

No hangars fitted.



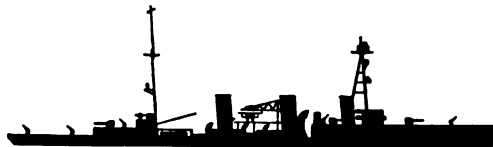
GREAT BRITAIN. Cruisers. ("E" class.) Emerald, Enterprise.

In Enterprise the forward 6-in. guns are in a twin mounting on the fore-castle deck.



JAPAN. Light Cruisers. ("Kuma" class.) Kiso, Kitakami, Kuma, Oi, Tama. ("Natori" class.) Isuzu, Natori, Nagara, Yura, Kinu, Abukuma.

Catapult fitted before mainmast. The mainmast is of tripod construction and is fitted with a derrick on its fore side. Bridgework modified and anti-flare tops fitted to funnels.



SOVIET UNION. Cruisers. Proflintern, Chervonnaya Ukraina.



JAPAN. Light Cruisers. ("Tenryu" class.) Tatsuta, Tenryu.



SPAIN. Light Cruiser. Mendez Núñez.

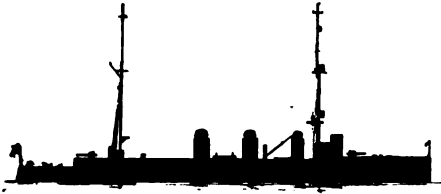
Foremast is tripod. Fore topgallant mast added.

A.A. armament fitted between second funnel and mainmast.

Searchlight platform fitted round after funnel.



GREECE. Cruiser. Averoff.



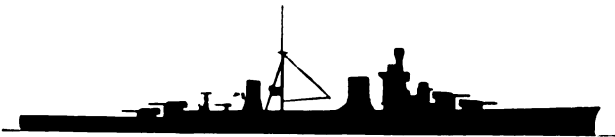
ITALY. Scout Cruiser. Quarto.



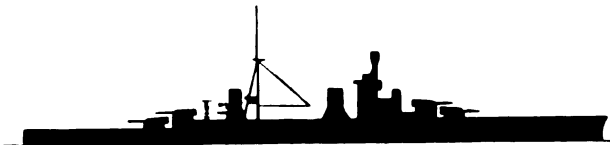
JAPAN. Cruisers. ("Nachi" class.) Nachi, Myoko, Ashigara, Haguro.
Catapult fitted abaft mainmast.



JAPAN. Cruisers. ("Takao" class.) Takao, Atago, Chokai, Maya.



ITALY. Cruiser. (Modified "Trento" class.) Bolzano.
Forward superstructure faired into funnel. Catapult fitted amidships.
Clinker screens fitted to funnels.



ITALY. Cruiser. ("Zara" class.) Gorizia.
Forward superstructure faired into funnel. Catapult fitted forward.
Clinker screens fitted to funnels.
Range-finder fitted abaft after funnel.

CRUISERS.



JAPAN. Cruisers. ("Furutaka" class.) Furutaka, Kato.
The tops of the funnels are square to the funnels.
Polemast raked.



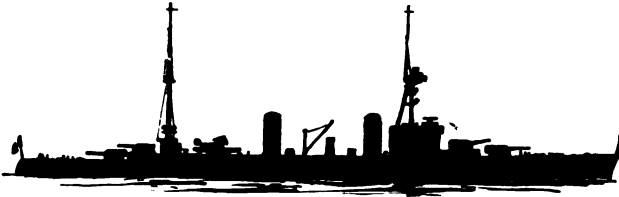
JAPAN. Cruisers. ("Furutaka" class.) Aoba, Kinugasa.
The tops of the funnels are square to the funnels.
Polemast raked.



GREAT BRITAIN. Cruisers. (Improved "Southampton" class.) Belfast, Edinburgh.



GREAT BRITAIN. Cruisers. ("Southampton" class.) Newcastle, Sheffield, Birmingham, Glasgow, Liverpool, Manchester.



FRANCE. Cruisers. ("Duquesne" class.) Duquesne, Tourville. ("Suffren" class. Suffren, Colbert, Foch, Duplex.
Colbert, Duplex and Foch have tripod mainmasts and the catapults between the funnels.
Fore topmast shortened in Foch, Duquesne and Tourville and removed in Duplex and Colbert.



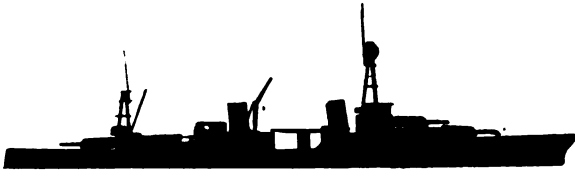
UNITED STATES. Cruisers. ("Astoria" class.) Astoria, New Orleans, Minneapolis, San Francisco, Tuscaloosa, Quincy, Vincennes.
Forward funnel fitted with clinker screen.



UNITED STATES. Cruisers. Portland, Indianapolis.
Foremost funnel and fore topmast are raised.



UNITED STATES. Cruisers. ("Pensacola" class.) Salt Lake City, Pensacola.
Crane fitted on fore side of after funnel and derricks on after side.



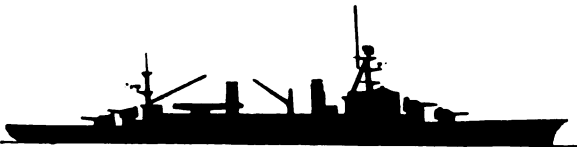
UNITED STATES. Cruisers. ("Chester" class.) Northampton, Chester, Louisville.
("Augusta" class.) Chicago, Houston, Augusta.
Fore topmast shortened.



UNITED STATES. Cruiser. Wichita.



UNITED STATES. Cruisers. Boise, Brooklyn, Helena, Honolulu, Nashville, Philadelphia, Phoenix, Savannah, St. Louis.



FRANCE. Training Cruiser. Jeanne d'Arc.
The catapults and fore topmast are removed.



FRANCE. Cruisers. Jean-de-Vienne, La Galissonnière, Marseillaise, Gloire, Montcalm, Georges Leygues.
Catapult fitted on after turret.



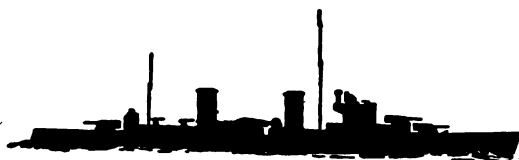
GREAT BRITAIN. Cruiser. ("York" class.) Exeter.
The funnels and masts are vertical.
Forward funnel has been modified.



COMMONWEALTH OF AUSTRALIA. Cruisers. (Modified "Leander" class.)
Perth, Hobart.
Catapult fitted between funnels.



GREAT BRITAIN. Cruisers. ("Fiji" class.) Ceylon, Jamaica, Gambia, Uganda, Kenya, Mauritius, Nigeria, Trinidad.



GREAT BRITAIN. Cruisers. ("Arethusa" class.) Arethusa, Penelope, Aurora.
Derrick fitted on aft side of after funnel.



GREAT BRITAIN. Cruisers. ("Dido" class.) Charybdis, Cleopatra, Dido, Euryalus, Hermione, Scylla, Sirius.



GERMANY. Light Cruiser. Köln.

Polemast fitted on aft side of after funnel. Catapult fitted between funnels.



FRANCE. Cruiser Minelayeur. Emile Bertin.

Derrick fitted on fore side of catapult.
Searchlight platform built round after funnel.
Small mast fitted on fore side of after turret.



ITALY. Cruisers. ("Condottieri" class.) Montecuccoli, Muzio Attendolo.



ITALY. Cruisers. ("Attendolo" class.) Eugenio di Savoia, Filiberto Duca d'Aosta.



ITALY. Cruisers. ("Condottieri" class.) Alberico de Barbiano, Alberto di Giussano, Giovanni della Bande Nera.

Fore topmast and stays to mainmast removed.
Derrick fitted on fore side of mainmast. Bridgework extended.



ITALY. Cruisers. ("Condottieri" class.) Armando Diaz, Luigi Cadorna.

Fore topmast removed. Catapult fitted between after funnel and "X" turret.
Derrick fitted on fore side of mainmast.



ITALY. Cruisers. Duca degli Abruzzi, Giuseppe Garibaldi.



ITALY. Cruiser. Bari (ex-German Pillau).



GREAT BRITAIN. Cruiser Minelayer. Adventure. (Stern has been extended.)
Derricks added abreast masts.



NETHERLANDS. Cruisers. Java, Sumatra.

Fore topmast shortened and foremast made larger.
Mainmast shortened, moved forward and fitted with derrick and searchlights.
Aircraft stowed between funnels and crane fitted.



ITALY. Cruisers. ("Trento" class.) Trento, Trieste.

Fore topmast removed.
Bridgework extended.



SPAIN. Cruisers. Galicia, Almirante Cervera, Miguel de Cervantes.

The mainmasts are tripods.
Fore topmast and topgallant mast removed.

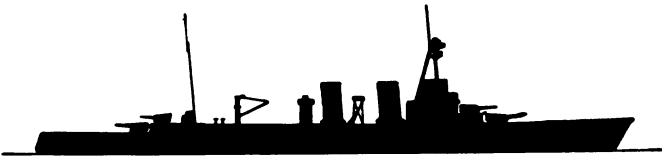


SPAIN. Cruiser. Navarra (ex-Republica).



GERMANY. Light Cruiser. Emden.

Polemast fitted on aft side of after funnel.
Superstructure added before mainmast. Fore topmast shortened.
Mainmast shortened and surmounted by a searchlight platform.



FRANCE. Cruisers. ("Duguay-Trouin" class.) La Motte Picquet, Duguay-Trouin, Primauguet.

Catapult fitted on quarter deck.
Fore topmast removed and mast head modified.



ARGENTINA. Cruiser. La Argentina.



GREAT BRITAIN. Cruisers. ("D" class.) Danae, Dauntless, Dragon.
Main topmast added.



GREAT BRITAIN. Cruisers. ("D" class: repeat vessels.) Delhi, Dunedin, Diomedea, Despatch, Durban.
Foremost gun in Diomedea is housed in a gunhouse.
Topmasts removed.



GREAT BRITAIN. Cruisers. ("Ceres" class.) Cardiff, Ceres, Curacao.
For Coventry, see below.



GREAT BRITAIN. Anti-Aircraft Cruisers. ("Ceres" class.) Coventry (as re-armed 1935). ("Carlisle" class.) Cairo, Colombo, Capetown, when finished.
Cairo has stay to mainmast and main topmast.



GREAT BRITAIN. Cruiser. Carlisle.
Topmast removed.



GREAT BRITAIN. Cruisers. ("Caledon" class.) Caledon, Caradoc.
Mainmast lengthened.



SOVIET UNION. Cruiser. Krasni Kavkaz.
Catapult fitted between mainmast and funnel.
A.A. guns fitted between funnels.



SWEDEN. Coast Defence Ship. Gustav V.
Fore topmast added. Bridgework enlarged.
Mainmast and derrick removed.



SWEDEN. Coast Defence Ship. *Sverige.*



SWEDEN. Coast Defence Ship. *Drottning Victoria.*



JAPAN. Cruisers. *Mikuma, Mogami, Suzuya, Kumano, Tono, Tikuma.*



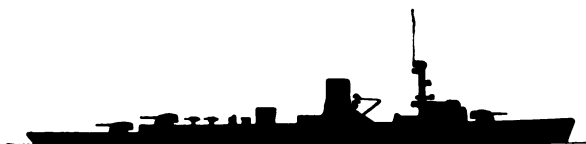
SPAIN. Cruiser. *Canarias.*
Masts removed.



FRANCE. Cruiser. *Algérie.*
Superstructure amidships added.
Crane replaced by two others.



GERMANY. Cruiser. *Admiral Hipper.*

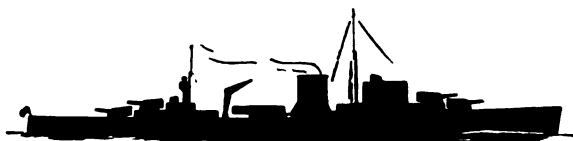


GERMANY. Light Cruiser. Leipzig.

Polemast fitted on aft side of funnel. Catapult fitted between funnel and foremast. Crane fitted on fore side of funnel. Fore topmast shortened.



GERMANY. Light Cruiser. Nurnberg.



GREAT BRITAIN. Cruisers. ("Leander" class.) Leander, Achilles, Orion, Ajax.



NETHERLANDS. Cruiser. De Ruyter.

Funnel top modified.



NETHERLANDS. Cruiser. Tromp.



ARGENTINA. Cruisers. Almirante Brown, Vinticino de Mayo.

Fore topmast shortened, main topmast lengthened.

Derrick fitted on fore side of mainmast.

Searchlight platform fitted on mainmast.

Superstructure built on aft side of mainmast.



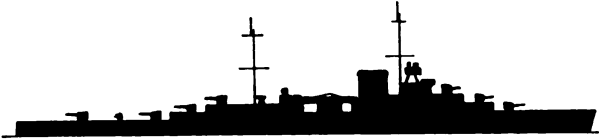
JAPAN. Light Cruiser. Yubari.
Masts and funnel raked aft.



FINLAND. Armoured Gunboats. Vainämöinen, Ilmarinen.



NORWAY. Minesweeping and Training Ship. Olav Trygvason.
Both cranes are fitted abreast mainmast.



GREAT BRITAIN. Cruisers. Frobisher, Hawkins.



DENMARK. Cruiser. Niels Juel.

FLOTILLA LEADERS AND DESTROYERS

(See pp. 241-282.)



FRANCE. Flotilla Leaders. Cassard, Vauquelin, Korsaint, Tartu, Le Chevallier Paul, Aigle, Albatros, Epervier, Milan, Gerfaut, Vautour.



ITALY. Destroyers. Gen. A. Cantore, Gen. A. Chinotto, Gen. A. Papa, Gen. A. Cassino, Gen. M. Prestinari, Gen. G. Montanari, A. Bassini, E. Cecozz, F. Stocco, G. Carini, G. Medici, G. la Farina, G. la Masa, G. Sirtoli, M. Fabrizi.
Bridgework extended.



FRANCE. Flotilla Leaders. Guépard, Lion, Vauban, Valmy, Verdun.



GERMANY. Destroyers. "Maass" class.



UNITED STATES. Destroyers. The "Flush Deck" type; all U.S. destroyers except these with three funnels.
Mainmast shortened.
Also, Great Britain—"Town" class.



GREAT BRITAIN. Destroyers. "Tribal" class.



YUGO SLAVIA. Flotilla Leader. Dubrovnik.



FRANCE. Flotilla Leaders. Tigre, Léopard, Lynx.
Platform added before after turrets.
Léopard and Lynx are under the control of the Free French.



JAPAN. 1st Class Destroyers. "Fubuki" class.
(23 ships.)



FRANCE. Destroyers. Mistral, Ouragon, Simoun, Tempête, Tramontane, Typhon, Trombe, Tornado.



ITALY. Flotilla Leaders (Scouts). "Navigatori" class. (11 ships.)
Mainmast lengthened.

POLAND. Destroyer. Burza is similar.
Mainmast shortened.



FRANCE. Flotilla Leaders. "Le Fantasque" class. L'Audacieux, Le Malin, Le Terrible, Le Triumphant, L'Indomitable.
Control platform added abaft after funnel.
Le Triumphant is under the control of the Free French.



GREAT BRITAIN. Flotilla Leader. Inglefield.



GREAT BRITAIN. Flotilla Leader. Faulknor.



JAPAN. 1st Class Destroyers. "Mutsuki" class (12 ships), and "Kamikaze" class (9 ships).



JAPAN. 1st class Destroyers. "Minekaze" class (15 ships).



GERMANY. Destroyers. *Hils*, *Tiger*, *Luise*, *Jaguar*, *Leopard*, *Seeadler*, *Greif*, *Albatros*, *Kondor*, *Falka*, *Möwe*.



GREAT BRITAIN. Destroyers. "Acasta," "Beagle," "Crusader" and "Defender" classes. "Acasta" and "Crusader" classes have davits at stern.
Flotilla Leaders. *Duncan*, *Kempfenfelt*.



GREAT BRITAIN. Destroyers. "Greyhound," "Hero" and "Intrepid" classes.



PORTUGAL. Destroyers. *Vouga*, *Lima*, *Dao*, *Toja*, *Douro*.
COLOMBIA. Destroyers. *Antioquia*, *Caldas*.



ARGENTINA. Flotilla Leaders. *Mendoza*, *La Rioja*, *Tucuman*.



ITALY. Flotilla Leaders (Scouts). *Carlo Mirabelli*, *Augusto Riboty*.



GREAT BRITAIN. Flotilla Leaders. *Broke*, *Keppel*, *Douglas*, *Campbell*, *MacKay*, *Malcolm*, *Montrose*.

ROYAL AUSTRALIAN NAVY. Flotilla Leader. *Stuart*.

SPAIN. Flotilla Leaders. *Almirante Valdes*, etc., generally similar.



NETHERLANDS. Destroyers. *Van Ghent*, *Evertsen*, *Piët Hein*, *Kortenaar*, *Banckert*, *Van Nes*, *Wittama With*.



GREAT BRITAIN. Destroyers. *Vanessa*, *Vanoe*, *Vanguard*, *Velox*, *Vendetta*, *Versatile*, *Vesper*, *Vidette*, *Violent*, *Vivacious*, *Vimy* (late *Vancouver*), *Vortigern*, *Valorous*, *Vampire*, *Viscount*, *Voyager*, *Walker*, *Walpole*, *Walrus*, *Warwick*, *Watchman*, *Westcott*, *Winchelsea*, *Wrastler*, *Vansittart*, *Venomous*, *Verity*, *Volunteer*, *Wanderer*, *Windsor*, *Veteran*.



GREAT BRITAIN. Destroyers. *Whitshank*, *Whitshed*, *Wildswan*, *Witherington*, *Wivern*, *Wolverine*, *Worcester*, *Wishart*, *Witch*.



GREAT BRITAIN. Destroyers. *Ambuscade*, *Amazon*.



CHILE. Destroyers. *Serrano*, *Orella*, *Riquelme*, *Hyatt*, *Videla*, *Aldoa*.
Mainmast heightened.



SWEDEN. Destroyers. *Klas Horn*, *Klas Uggla*, *Ehrenschild*, *Nordenskjöld*.
Davit fitted at stern.



JAPAN. 2nd Class Destroyers. "Wakatake" class (7 ships), and "Kaya" class (10 ships).



ITALY. Destroyers. O. Sella, F. Crispi. Bridgework extended. Platform fitted round mainmast.



JAPAN. Destroyers. "Hibiki" class.



JAPAN. Destroyers. "Arisaka" class (6 ships).



GREAT BRITAIN. Flotilla Leader. Faulknor. Destroyers. "Eclipse" and "Fearless" classes similar but gun between funnels omitted.



GREAT BRITAIN. Destroyers. Admiralty "g" class.



ITALY. Destroyers. San Soffirino, Martino. Bridge and foremost funnel heightened.



ITALY. Destroyers. Turbine, Euro, Ostro. Bridge and foremost funnel heightened.



DENMARK. Torpedo Boats (1st Class). Gienlin, Hogen, Ornen, Laxen, Dragon, Hvalen.



UNITED STATES. Destroyers. Grayson, Eberle, Plunkett, Kearney, Gwin, Meredith, Livermore, Monssen, Woolsey, Ludlow, Edison, Ericsson, Wilkes, Nicholson, Swanson, Ingraham, Fletcher, Radford, Jenkins, La Valetta, Nicholas, O'Bannon, Chevalier, Percival.



UNITED STATES. Destroyers. "Farragut" class.



GREAT BRITAIN. Destroyers. "Javelin" and "Kelly" classes.



POLAND. Destroyer. Blyskawica.



UNITED STATES. Destroyers. "Maury" class.



ITALY. Destroyers. Dardo, Freccia, Strale, Saetta, Folgore, Lampo. Bridgework extended. Control platform fitted between torpedo tubes.



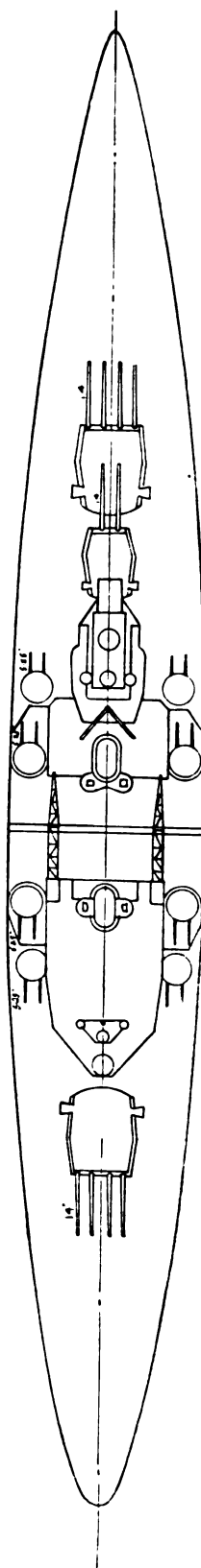
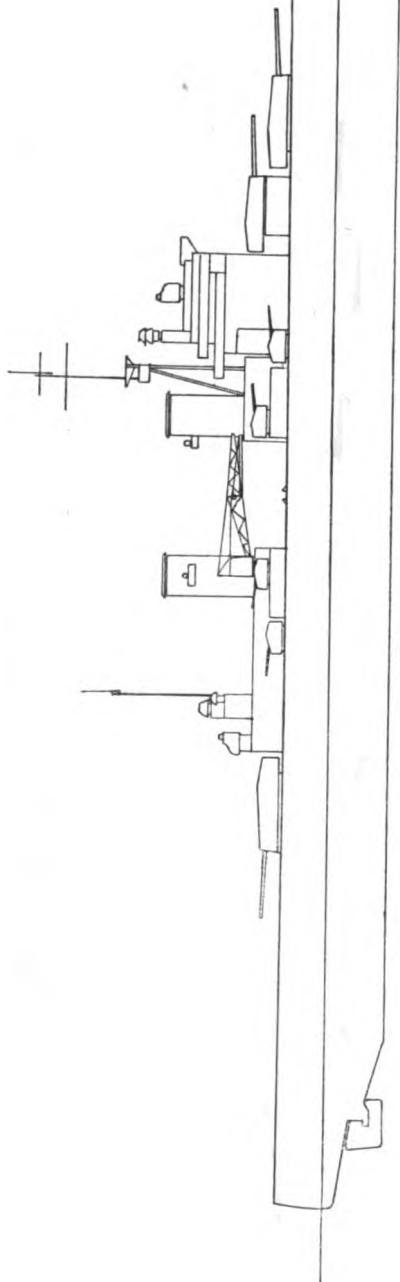
GREECE. Destroyers. Hydra, Spetzai, Psara and Coundouriotis.

PICTORIAL SECTION PLANS AND ELEVATIONS OF WARSHIPS

GREAT BRITAIN.

BATTLESHIPS.

King George V. Duke of York. Howe. Anson.



36,000 tons.

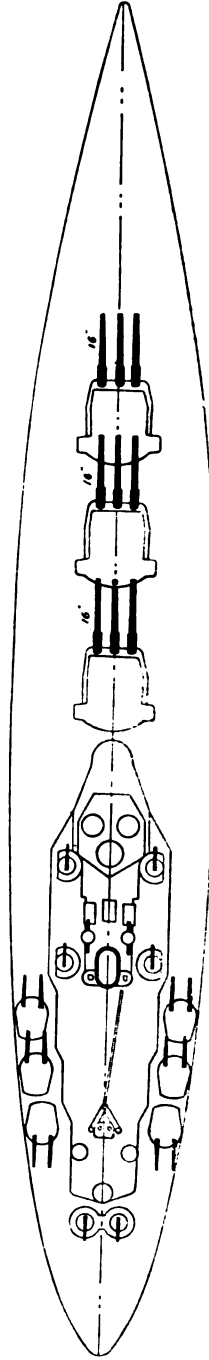
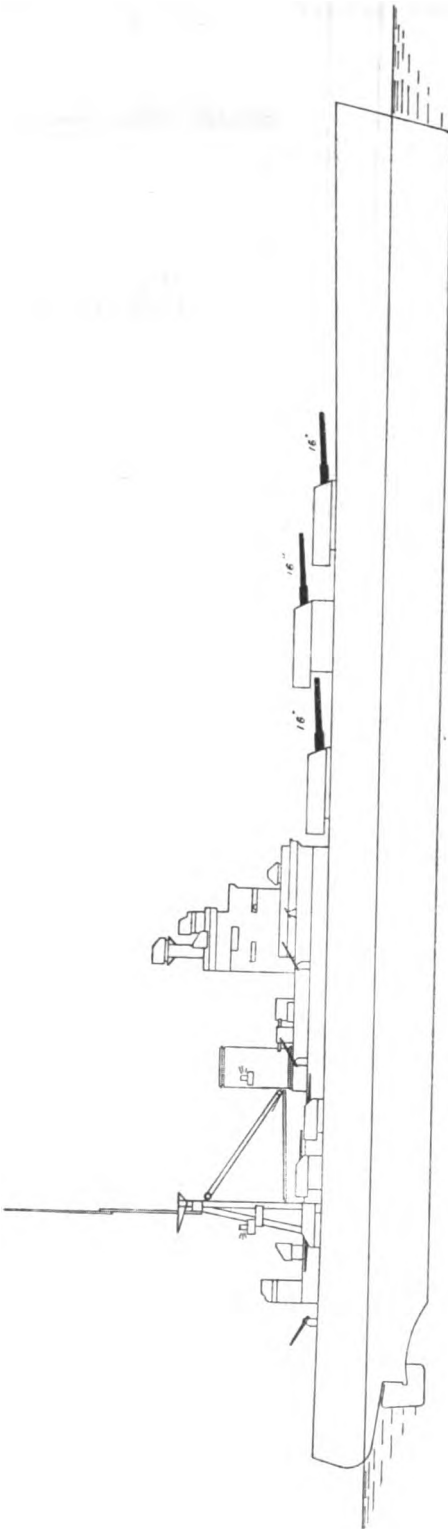
Armament, 10—14-in. ; 16—525-lb.

GREAT BRITAIN.

BATTLESHIPS.

Nelson.

Rodney.



Length (extreme), 710 ft. ; Rodney, 33,900 tons ; Nelson, 33,500 tons ; Speed, 23 knots ; Completed, 1907.

Armament, 9—16-in. ; 19—6-in. ; 6—4.7-in. A.A. ; 4—3-pr. ; 2—2-pr. Pom Poms (3 in Rodney) ; 11 L. ; 6 M. ; 2—24-in. submerged torpedo tubes.

NOTE.—A 16-in. waterline armour belt extends from approximately the foremost 16-in. turret to approximately the aftermost 6-in. turret. The turret armour varies from 16-in. to 9-in. Correction to plan.—Mast structure increased. Nelson has a crane amidships. Rodney has a catapult on "O" turret.

GREAT BRITAIN.

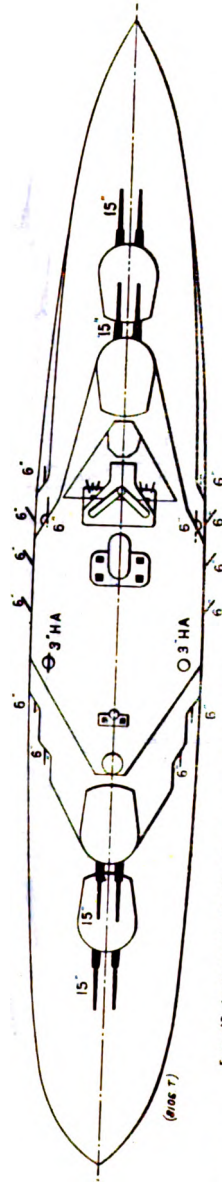
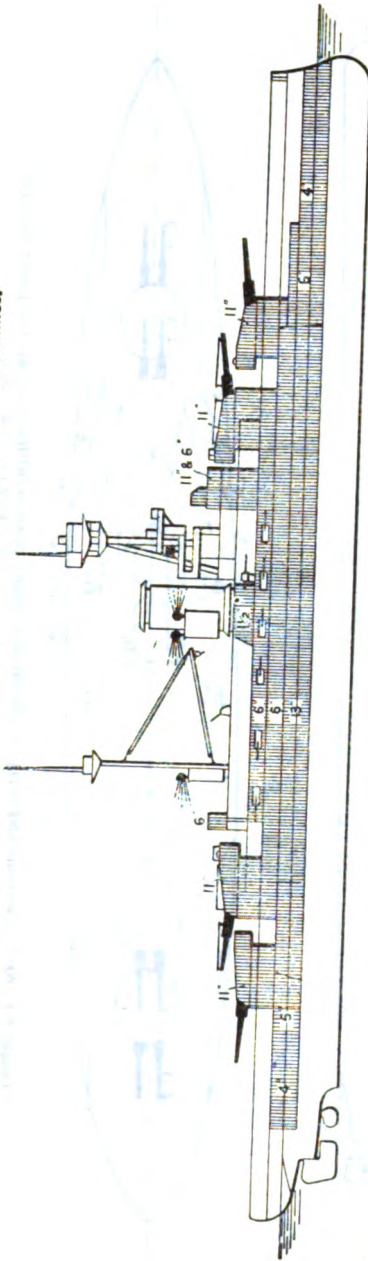
BATTLESHIPS.

Royal Sovereign.

Revenge.

Resolution.

Ramillies.



Length (extreme), 620 ft. 6 ins.* ; Length B.P., 580 ft. ; 23,150 tons ; Speed, 23 knots (without bulges) ; Completed, 1916-17.
 Armament, 8-15-in. ; 12-6-in. ; 8-4-in. A.A. ; 4-3-pr. ; 5 m. ; 10 l. ; 2-21-in. submerged torpedo tubes in Revenge. Revenge and Ramillies have
 Corrections to plan.—Searchlights on mainmast and the superstructure 6-in. guns now removed. The 4-in. A.A. guns are fitted on the superstructure
 instead of the 3-in. H.A. shown. Fore topmast removed. Main topgallant mast fitted.

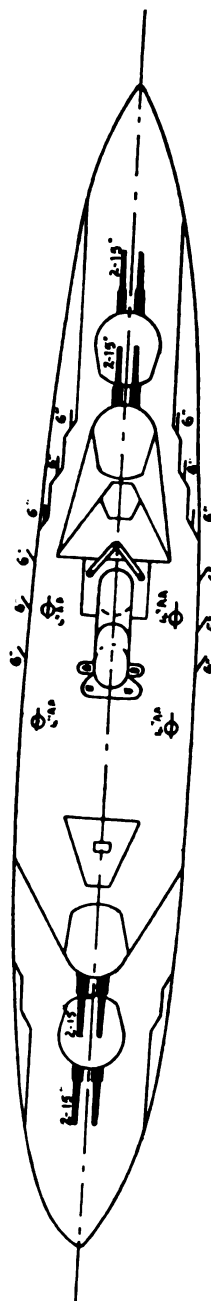
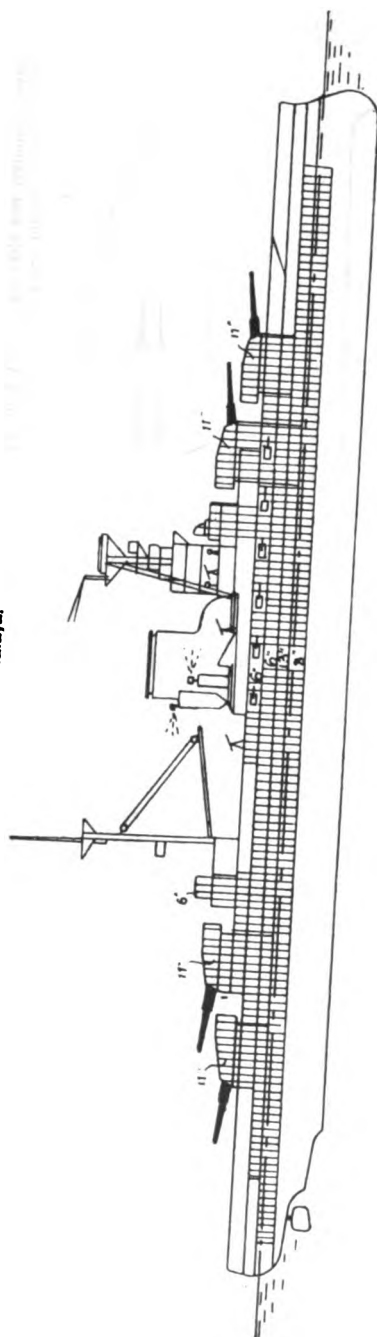
* Revenge, 625 ft. 9 in.

Resolution and Ramillies have tripod mainmasts, a catapult on "X" Turret and a crane abreast the mainmast, and carry 1 aircraft each.
 Resolution has clinker screen fitted to funnel.

GREAT BRITAIN

BATTLESHIP.

Malaya.



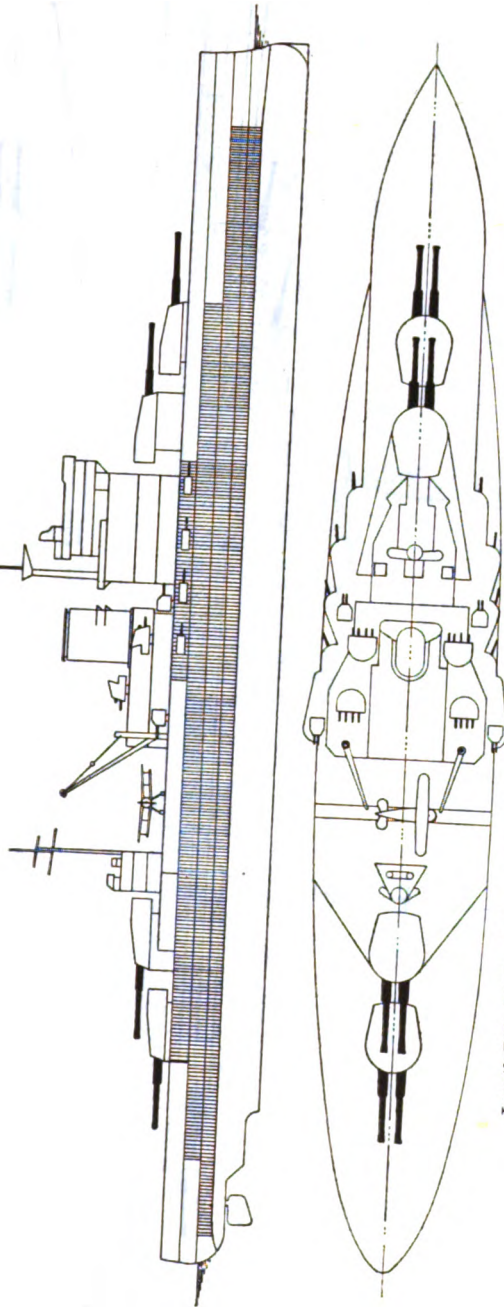
Length B.P., 600 ft. ; (extreme 639½—644½ ft.) ; 31,100 tons ; Speed, 25 knots (without bulges) ; Completed, 1915-1916.
 Armament, 8—15-in. ; 12—6-in. ; 12—4-in. A.A. ; 4—8-pr. ; 6 M. ; 10 L.
 Correction to plan. Add main topgallant mast, catapuit before mainmast, a hangar and crane each side abreast funnel. Derrick removed.

**GREAT BRITAIN.
BATTLESHIPS.**

Warspite.

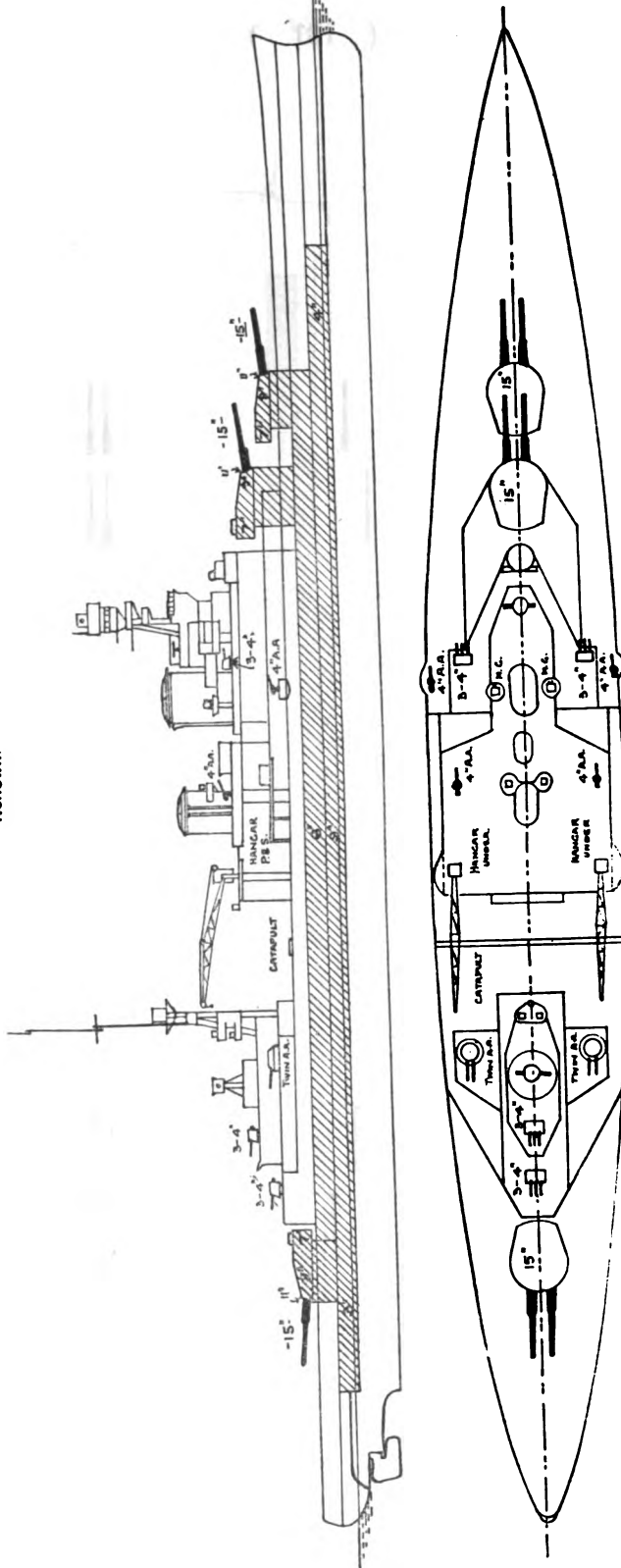
Queen Elizabeth.

Valliant.



Length B.P., 600 ft.; (extreme 639 ft. 8 ins.—646 ft.); 31,100 tons; Speed, 25 knots; Completed, 1915-1916.
Armament, 8—15-in.; 12—6-in.; 8—4-in. A.A.; 4—3-pdr. Pom Poms; 1 catapult; 1 aircraft. Valliant has 4—4-in. A.A.
NOTES.—Queen Elizabeth and Valliant have tripod foremasts.
Sternwalk fitted in Warspite and Queen Elizabeth.

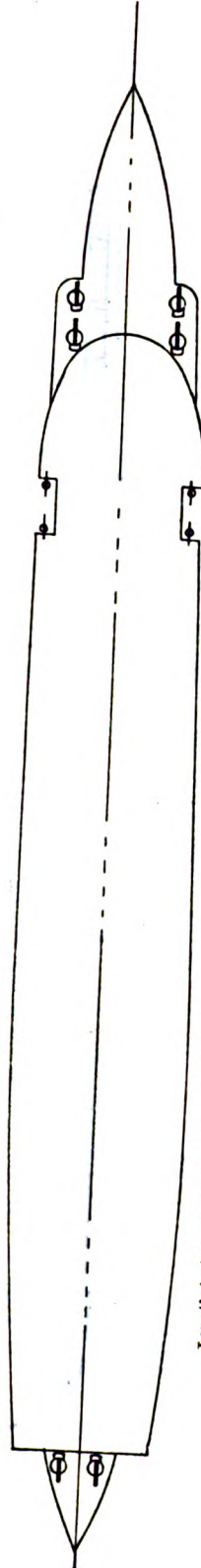
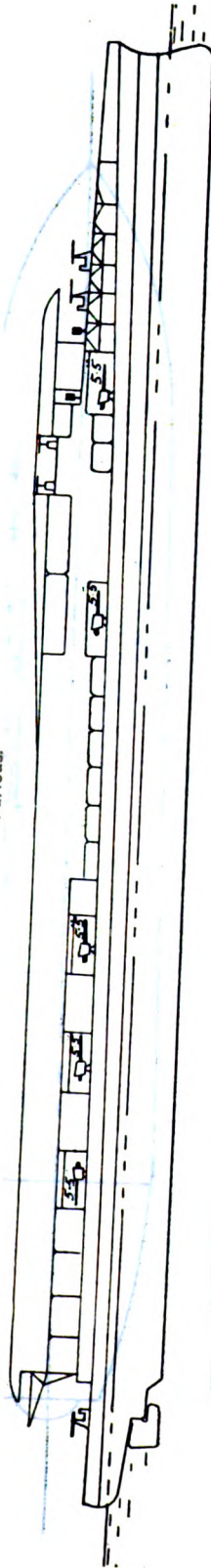
GREAT BRITAIN.
BATTLE-CRUISER.
 Renown.



Length (extreme), 794 ft. 2 in. ; 32,000 tons ; Speed, 31½ knots (without bulges) ; Completed, 1916. Reconstructed 1939.
 Armament, 6—15-in. ; 12—4-in. ; 4—4-in. A.A. ; 2 twin A. ; 9 multi-machine guns ; 1 catapult ; 4 aircraft.
 Correction to plan.—Forward superstructure modified. Topmast and topgallant mast fitted to foremast.
 The after funnel is similar to the foremast funnel.
 Tripod mainmast replaced by polemast. Main topgallant mast removed.

GREAT BRITAIN.
AIRCRAFT CARRIER.

Furious.

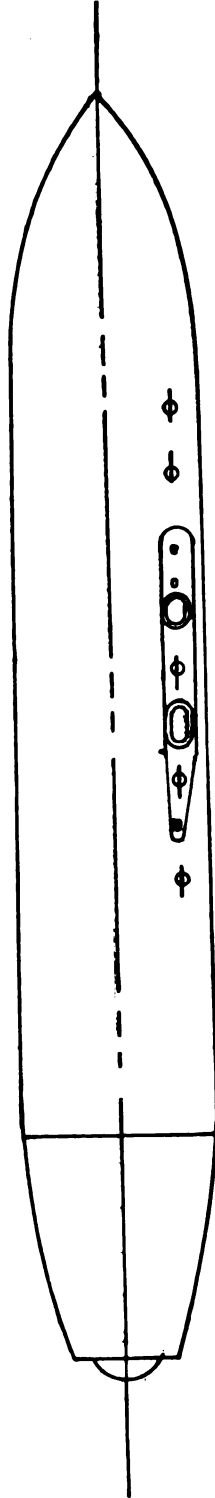
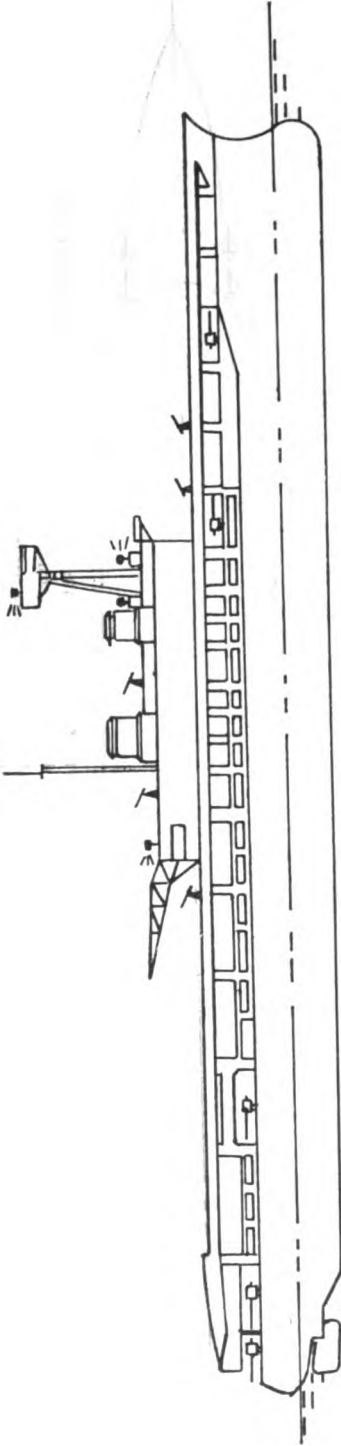


Length (extreme), 786 ft. 6 ins. ; 22,450 tons ; Speed, 31 knots ; Completed as a cruiser, 1917 ; Conversion to aircraft carrier completed, 1925.
Armament, 10—5.5-in. ; 3—4-in. A.A. ; 4—3-pr. ; 4—2-pr. ; 46 smaller ; 33 aircraft.
Three wireless masts added each side of flight deck. Quarter deck has been raised one deck.

Top deck forward has been levelled off and closed in.

Superstructure, polemast and spotting-top fitted amidships on the starboard side.

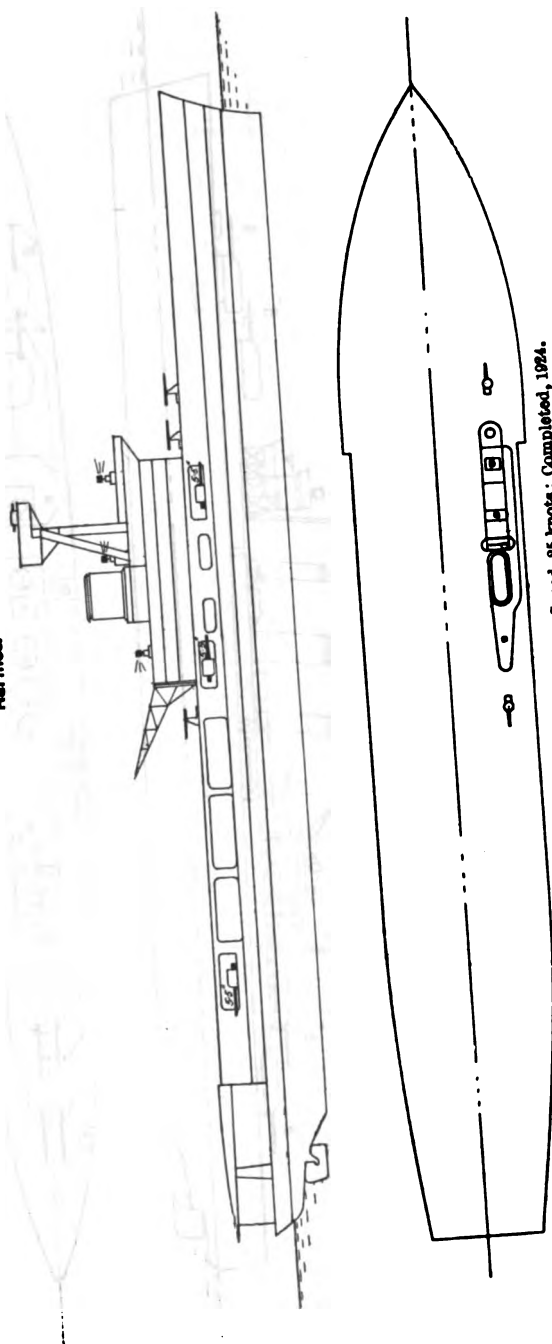
GREAT BRITAIN.
AIRCRAFT CARRIER.
Eagle



Length (extreme), 667 ft. 6 ins.; 22,600 tons; Speed, 24 knots; Completed as an aircraft carrier, 1924.
Armament, 9-6-in.; 4-4-in. A.A.; 4-3-pr.; 32 smaller; 20 aircraft.
Fore topmast added and mast structure modified.
Signal mast added forward.

**GREAT BRITAIN.
AIRCRAFT CARRIER**

Hermes.

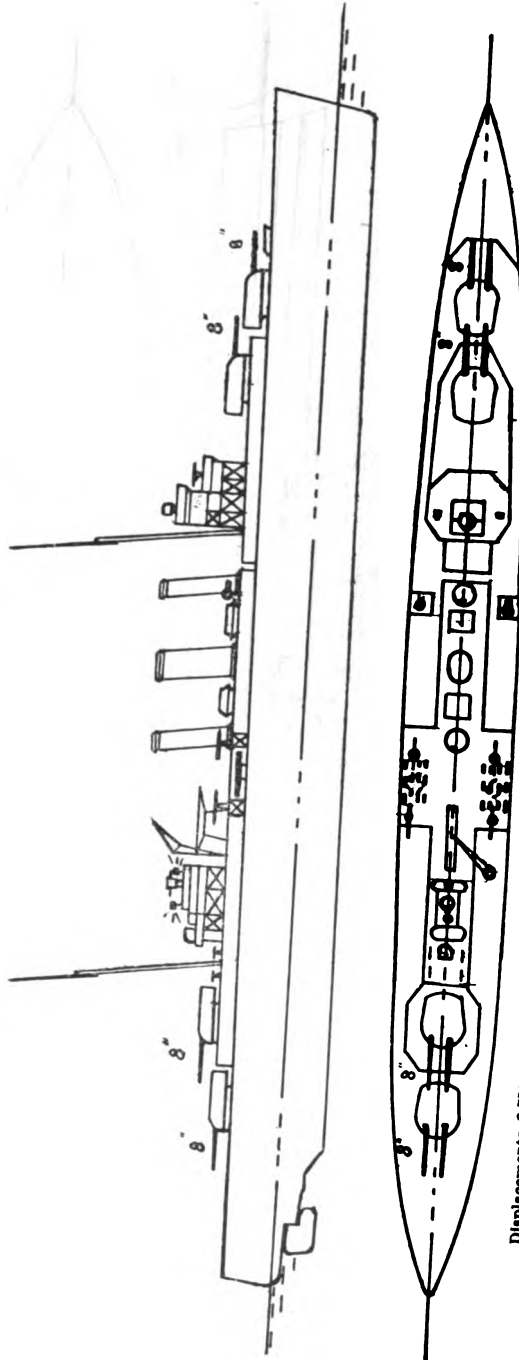


Length (extreme), 600 ft. ; 10,850 tons ; Speed, 25 knots ; Completed, 1924.
Armament, 6-6-in. ; 3-4-in. A.A. ; 4-3-pr. ; 2-2-pr. Pom Poms ; 4 M. ; 16 L. ; 15 aircraft.
Flight deck extended aft. Fore topmast and signal mast forward added.

GREAT BRITAIN.

CRUISERS.

London.	"London" Class.	Devonshire
Sussex.	Shropshire.	
	"Norfolk" Class.	
Dorsetshire.*	Norfolk.*	



Displacement, 9,730—9,800 tons; Length (extreme), 630 ft.; Norfolk and Dorsetshire, 633 ft. Armament, 8—8-in.; 8—4-in. A.A.; 4—3-pr.; 4—2-pr. Pom Foms; 4 M.; 8 L.; 8—21-in. torpedo tubes; 1 aircraft; 1 catapult.

* In Dorsetshire and Norfolk the seaplane crane and the 4—4-in. guns are slightly forward of the positions shown. Fore topgallant mast added.

GREAT BRITAIN.

CRUISERS.

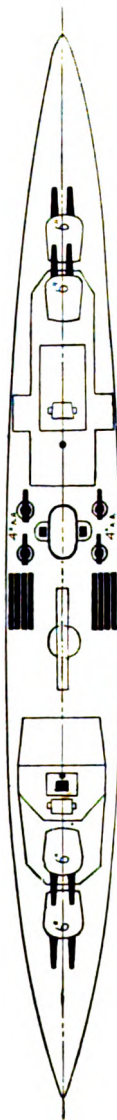
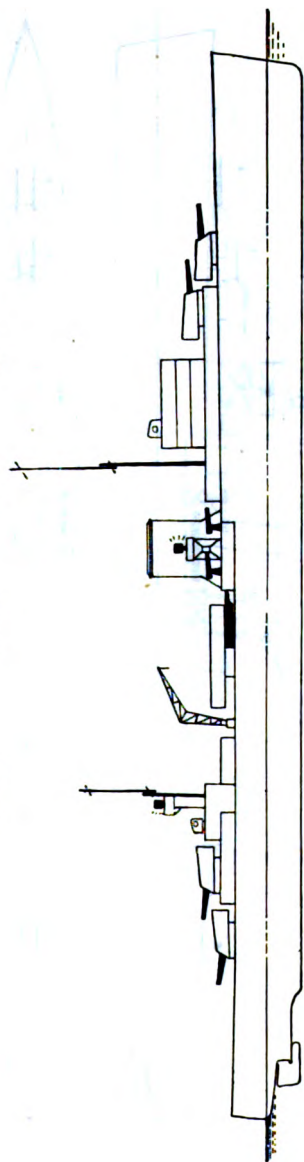
"Leander" Class.

Leander.

Achilles.

Orion.

Ajax.

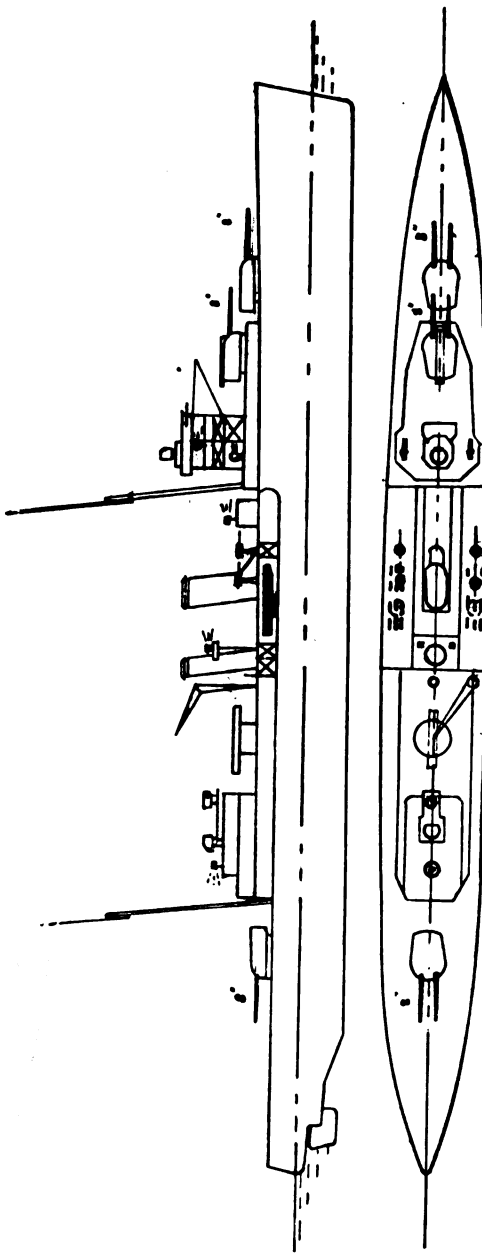


Displacement, 6,985-7,270 tons ; Length (extreme), 554 ft. 6 ins. ; Speed, 32½ knots. Armament, 8-6-in., 8-4-in. A.A., 4-3-pr. 8 torpedo tubes, 1 catapult ; 2 aircraft. Achilles has 4-4-in. A.A.

Leander and Achilles are attached to New Zealand division and have 1 aircraft.

GREAT BRITAIN.

CRUISER.

*"York" Class.**Exeter.*

Displacement : 8,380 tons; Length (extreme), 575 ft.; Speed : 32 knots. Armament, 6-8-in. : 4-4-in. A.A., 4-8-pr. ; 2-2-pr. ; 4 M. ; 8 L. ; 6-21-in. torpedo tubes ; 2 catapults and 2 aircraft.

The funnels and masts are vertical, and the mainmast is taken up through the superstructure.

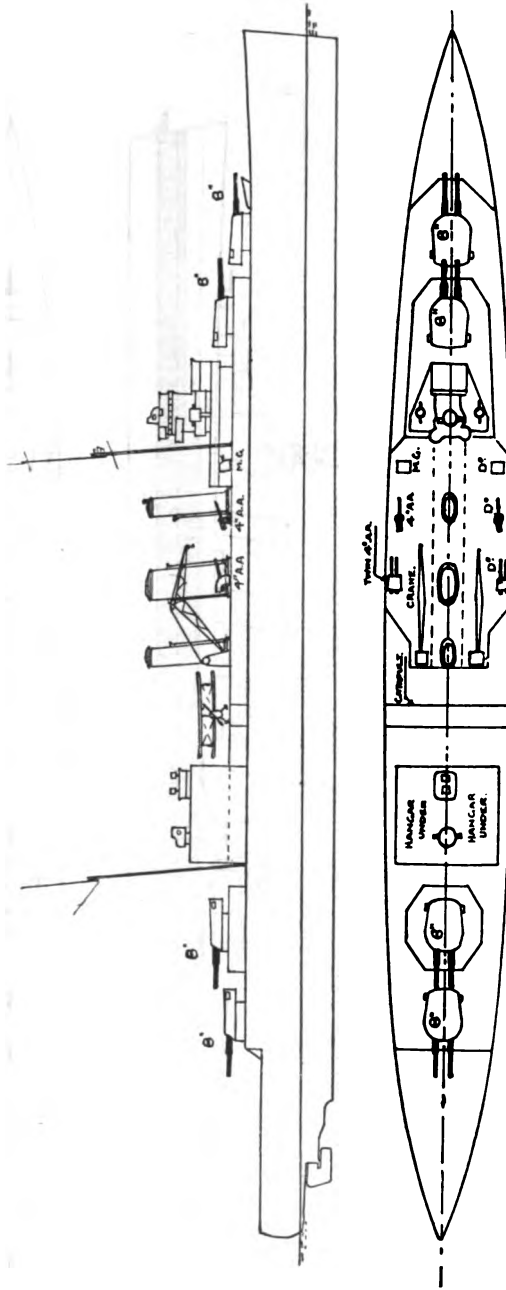
GREAT BRITAIN.

CRUISERS.

"Kent" Class.

Berwick.	Kent.	Cumberland.	Suffolk.	Cornwall	Australia.*	Canberra.*
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(As reconstructed 1938-1939.)



Length (extreme), 630 ft. ; 10,000 tons ; Speed $31\frac{1}{2}$ knots ; Completed 1928. Armament, 8—8-in. ; 8—4-in. A.A. ; 2 multi-machine guns ; 1 catapult ; 3 aircraft. Kent, Australia and Canberra have 1 aircraft ; Cumberland and Suffolk have 6—4-in. A.A. ; Australia and Canberra have 4—4-in. A.A.

NOTES.—Berwick, Kent, Cornwall, Australia, and Canberra are flush-decked.

Royal Australian Navy. Australia and Canberra are not provided with hangars

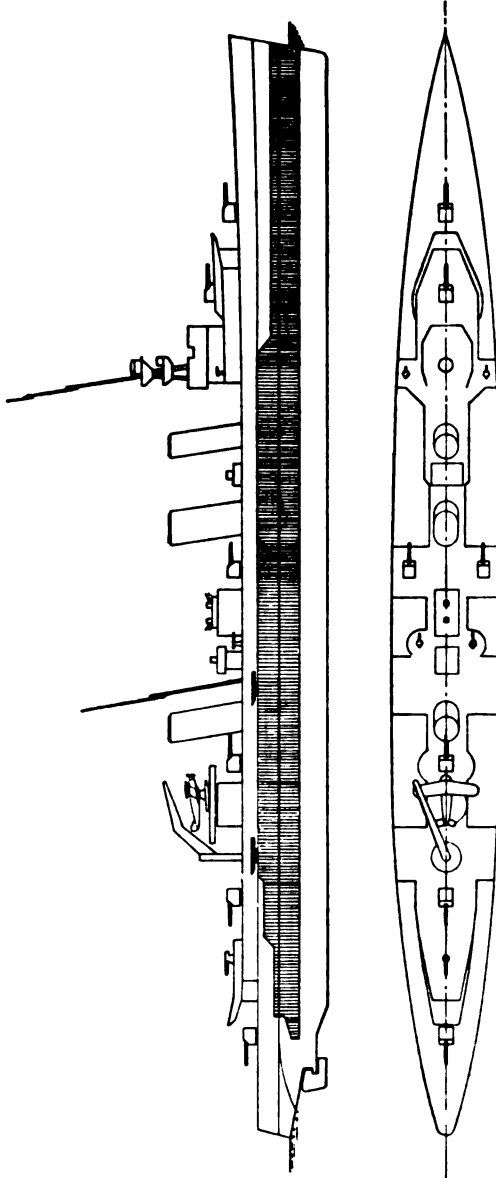
GREAT BRITAIN.

CRUISERS.

"G" Class.

Emerald.

Enterprise.



Length (extreme), 570 ft. ; Length B.P., 585 ft. ; Emerald, 7,550 tons ; Enterprise, 7,680 tons ; Speed, 33 knots.
 Armament, 7-6-in. ; 3-4-in. A.A. ; 4-3-pr. ; 2-2-pr. Pom Poms ; 2 M. ; 8 L. ; 16-21-in. torpedo tubes ; 1 catapult ; 1 aircraft.

• In Enterprise the two forward 6-in. guns are mounted in a twin mounting on forecastle deck.

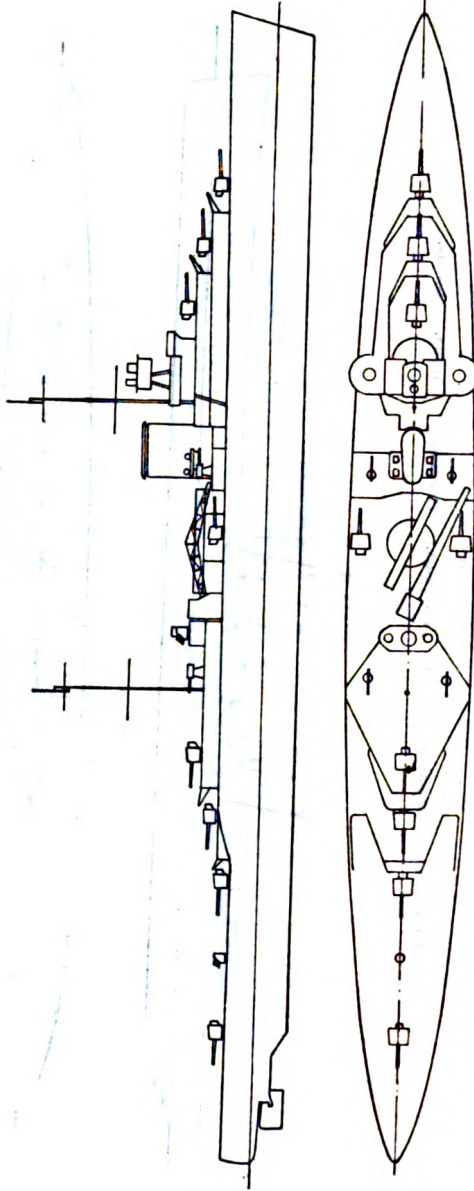
GREAT BRITAIN.

CRUISERS.

"Hawkins" Class.

Hawkins.

Frobisher.



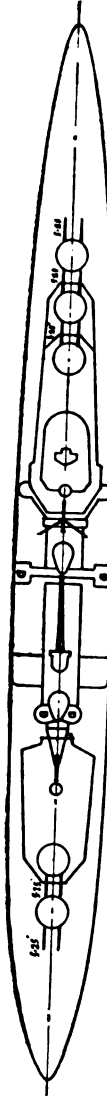
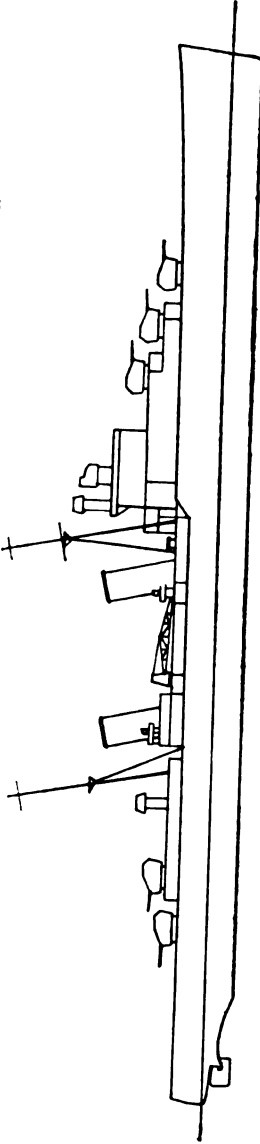
Length (extreme), 605 ft. ; Length B.P., 565 ft. ; 9,550—9,800 tons ; Speed : Hawkins 29½ knots ; Frobisher 30½ knots.
 Armament : 9—6-in. ; 4—4-in. A.A. ; 4—3-pr. ; 2—2-pr. ; 2 M. ; 8 L. ; 4 torpedo tubes.

GREAT BRITAIN.

CRUISERS.

"Dido" Class.

Charybdis. Cleopatra. Dido. Euryalus. Hermione. Scylla. Sirius.



5,450 tons.

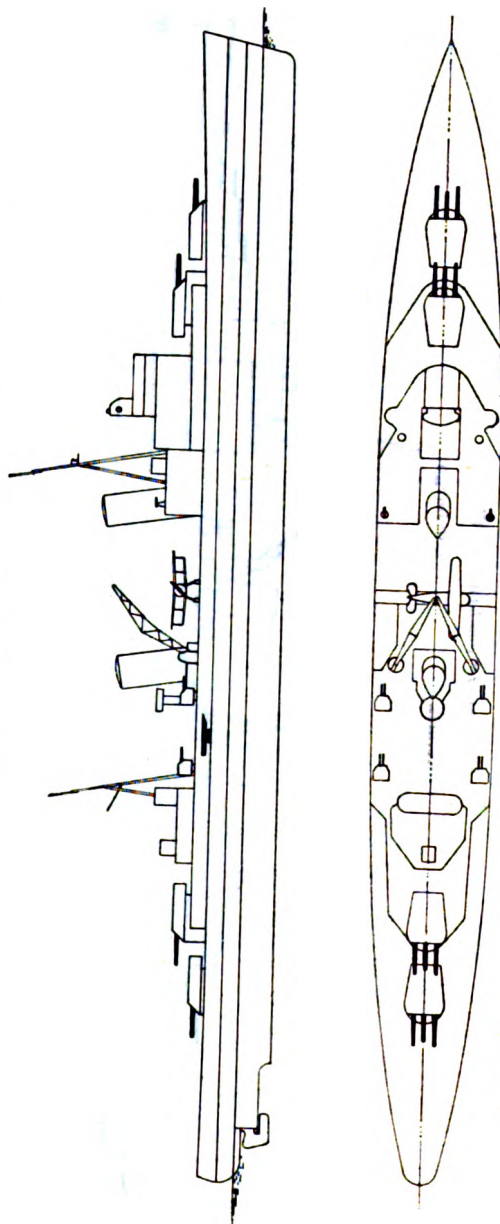
Armament, 10—6-25-in.; 8—31-in. torpedo tubes; 1 catapult; 1 aircraft.

GREAT BRITAIN.

CRUISERS.

"Southampton" Class.

Newcastle, Sheffield, Birmingham, Glasgow, Liverpool, Manchester.



Length (extreme), 591 ft. 6 ins.; 9,100 tons (Liverpool and Manchester 9,400 tons); Speed, 32 knots; Completed, 1937-38.
Armament, 12-6-in.; 8-4-in. A.A.; 2-2-pr.; 6-21-in. torpedo tubes; 1 catapult; 3 aircraft.

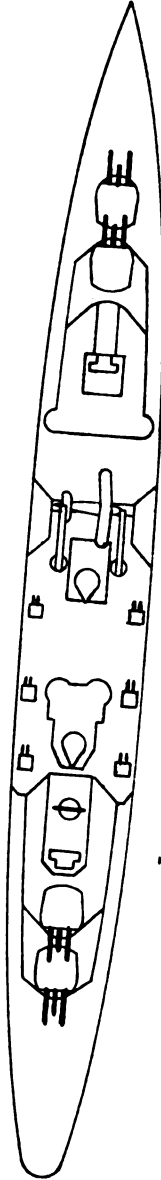
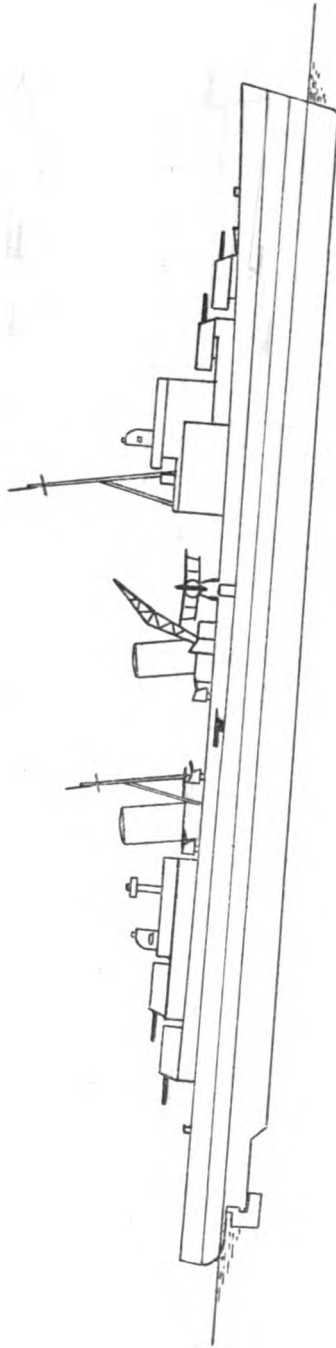
GREAT BRITAIN.

CRUISERS.

Improved "Southampton" Class.

Belfast.

Edinburgh



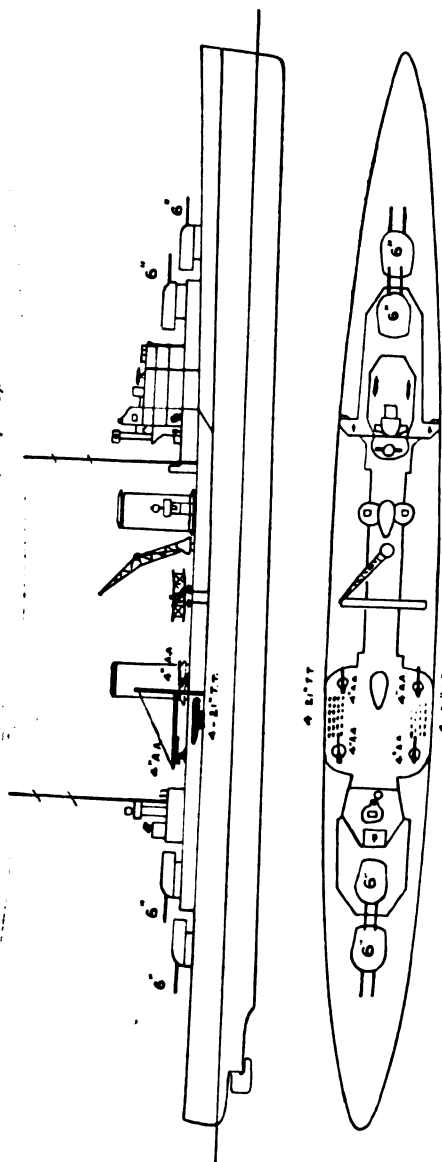
Length (extreme), 613 ft. 6 ins.; 10,000 tons; Speed, 32½ knots.
Armament 12—6-in.; 12—4-in. A.A.; 20 smaller guns; 6 torpedo tubes.

COMMONWEALTH OF AUSTRALIA.

CRUISERS.

Modified "Leander" Class.

Perth (ex Amphion). Hobart (ex Apollo).



Displacement, 6,850-7,100 tons; Length (extreme), 560 ft.; Speed, 32½ knots; Completed, 1936.
 Armament, 8-6-in; 8-4-in. A.A.; 18 smaller guns; 4 quadruple 21-in. torpedo tubes; 1 catapult; 2 aircraft.

GREAT BRITAIN.

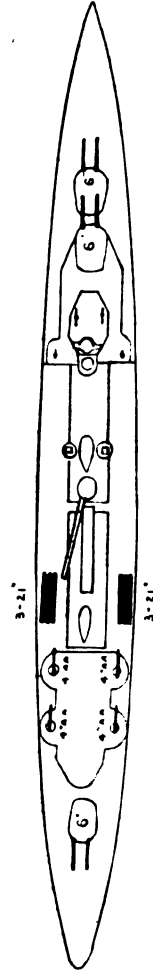
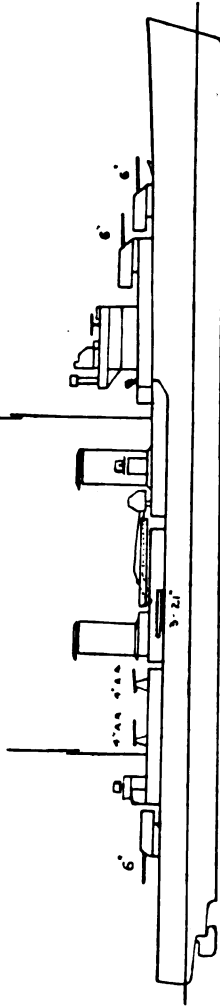
CRUISERS.

"Arethusa" Class.

Arethusa.

Penelope.

Aurora.



Displacement, 5,220-5,270 tons ; Length (extreme), 108 ft. ; Speed, 89½ knots ; Completed 1885-87.
 Armament, 6-6-in. ; 4-4-in. A.A. ; 2-3-pr. ; 18 smaller ; 2 triple 21-in. torpedo tubes ; 1 catapult, 1 aircraft

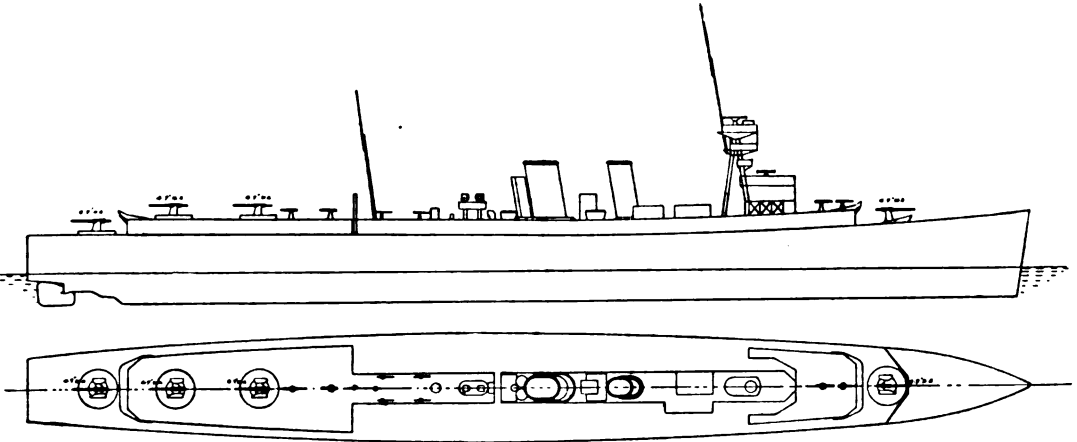
Aurora and Penelope have 4 twin 4-in. A.A. mountings instead of singles.

•Derrick fitted on aft side of after funnel.

GREAT BRITAIN.

CRUISER MINELAYER.

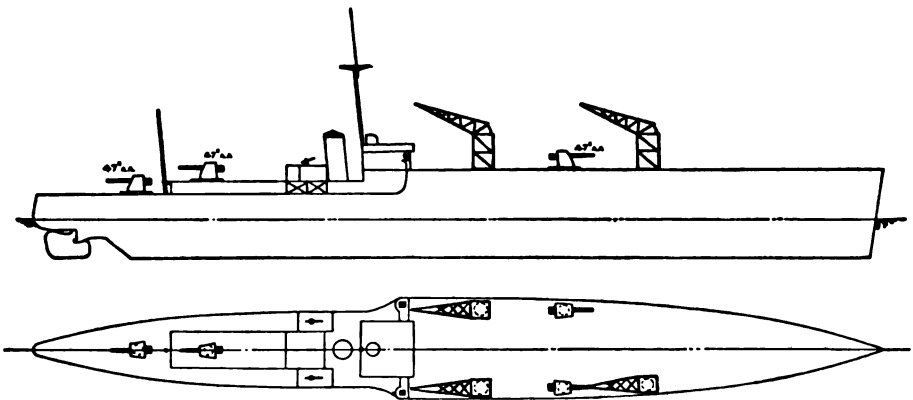
Adventure.



Length (extreme), 539 ft. ; Length B.P., 500 ft. ; 6,740 tons ; Speed, 28 knots.
Armament, 4—4'7-in. A.A. ; 4—3-pr. ; 4—2-pr. ; 2 M. ; 8 L. ; 310 mines.
Stern has been lengthened and rounded in plan. Derricks added abreast masts.

SEAPLANE CARRIER.

Albatross.



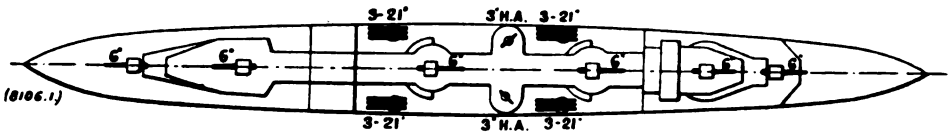
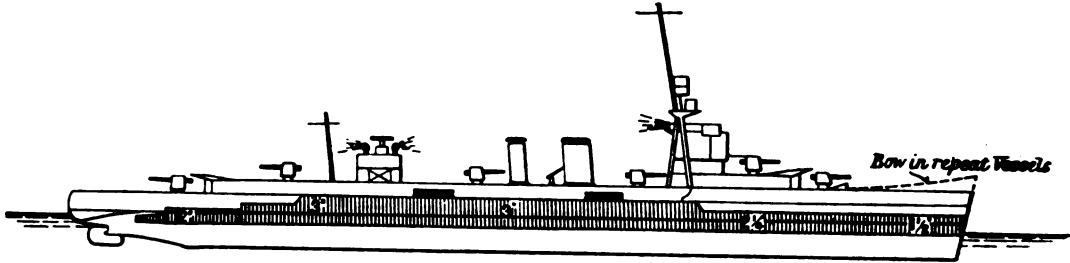
Length, 443½ ft. ; 4,800 tons ; Speed, 21 knots ; Completed, 1929.
Armament, 4—4'7-in. A.A. ; 4—2-pr. Pom Poms ; 4—3-pr. ; 4 M. ; 20 L. ; 9 seaplanes.
Catapult fitted forward.

GREAT BRITAIN.

CRUISERS.

"D" Class.

*Despatch. *Diomedé. Danae. Dauntless. Dragon. *Dethl.
 *Durban.



Length, 472½ ft. ; 4,850 tons ; Speed, 29 knots ;
Armament, 6—6-in. ; 3—4-in. A.A. ; 4—3-pr., 2—2-pr. ; 2 M. ; 8 L. ; 12—21-in. torpedo tubes.

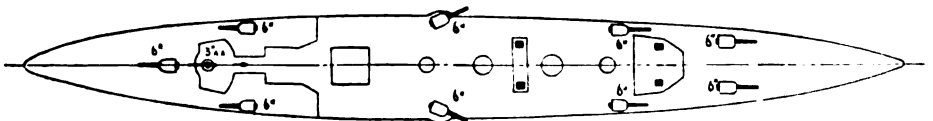
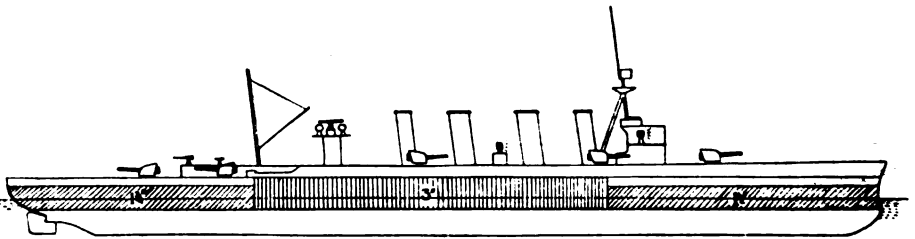
Main topmast fitted. Foremost gun in Diomedé housed in gunhouse.

* Repeat vessels.

COMMONWEALTH OF AUSTRALIA.

CRUISER.

Adelaide.



Length, 462½ ft. ; 5,100 tons ; Speed, 25½ knots.
Armament, 9—6-in. ; 4—3-pr. ; 1—3-in. A.A. ; 8 L. ; 2 submerged 21-in. torpedo tubes.
Forward funnel removed and superstructure modified.

GREAT BRITAIN.

CRUISERS.

"Ceres" Class.

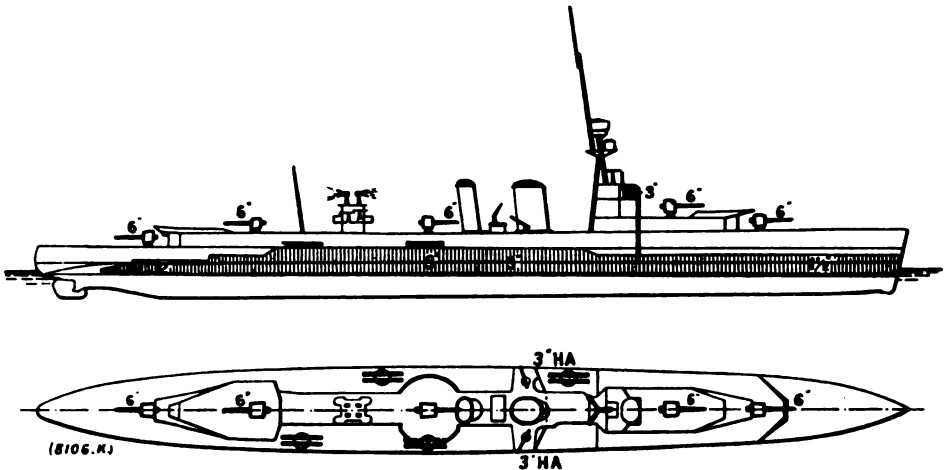
Ceres.

Curacao.

Cardiff.

"Carlisle" Class.

Carlisle.



Length (extreme), 450 ft.-451 ft. 9 ins. ; Length B.P., 425 ft. ; 4,200-4,290 tons ; Speed, 29 knots ; Completed, 1917-22

Armament, 5—6-in. ; 2—3-in. A.A. ; 4—3-pr. ; 2—2-pr. Pom Poms ; 4 above-water 21-in. D.R. torpedo tubes.
Cardiff, Curacao, and Ceres have 2—3-pr.

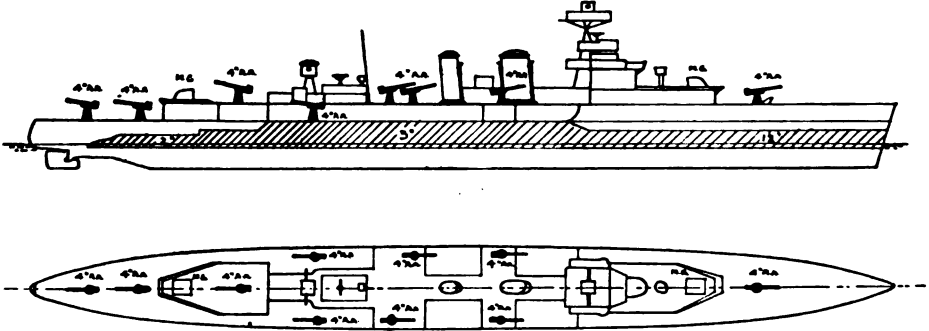
Carlisle has a trawler bow.

GREAT BRITAIN.

CRUISERS.

"Ceres" Class.

Coventry. Cairo.
Capetown and Colombo when completed.
Anti-Aircraft gun ships.

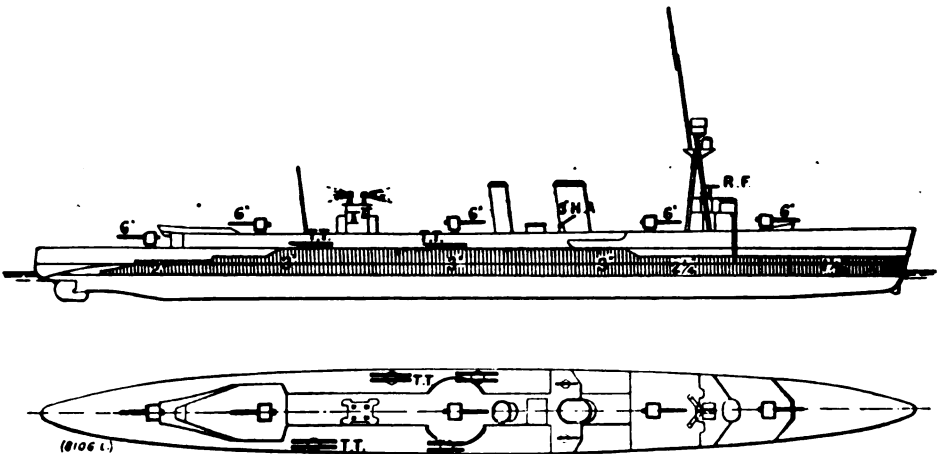


Length (extreme), 450 ft. ; 4,290 tons ; Speed, 29 knots ; Completed, 1917.
Armament, 10—4-in. A.A. ; 2—8-pr. ; 2 multi-machine guns ; 2 M.G. ; 8 L. ; 8—21-in. torpedo tubes.
Cairo have 8—4-in. A.A.
In Cairo mainmast is fitted with stay and topmast.

CRUISERS,

"Caledon" Class.

Caledon. Caradoc.



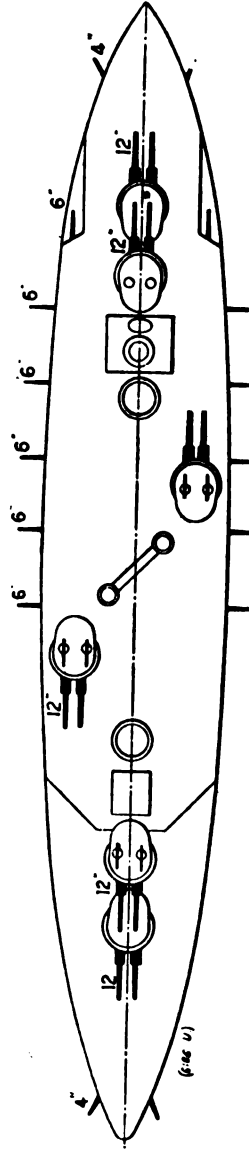
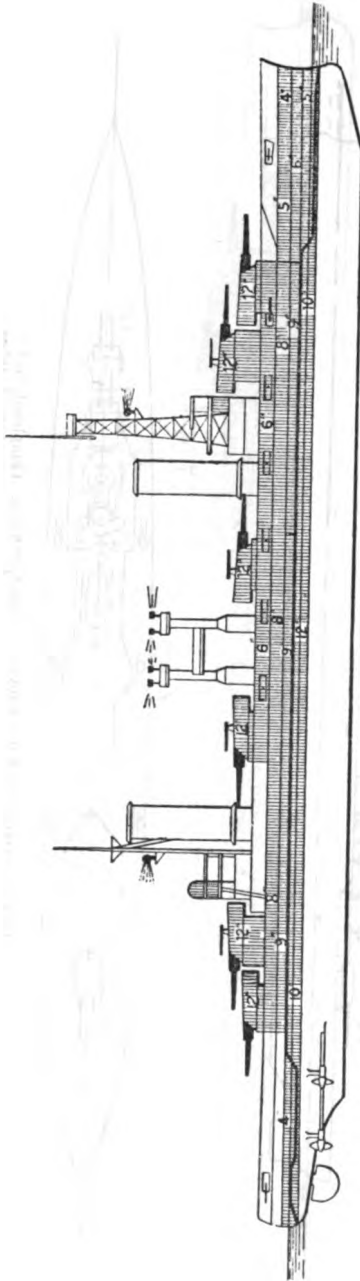
Length (extreme), 450 ft. ; Length B.P., 425 ft. ; 4,180 tons ; Speed, 29 knots ; Completed, 1917.
Armament, 6—6-in. ; 2—3-in. A.A. ; 4—8-pr. ; 2—2-pr. Pom Poms ; 2 M. ; 8 L. ; and 4 above-water 21-in. D.R. torpedo tubes.
Mainmast lengthened.

ARGENTINA.

BATTLESHIPS.

Moreno.

Rivadavia.



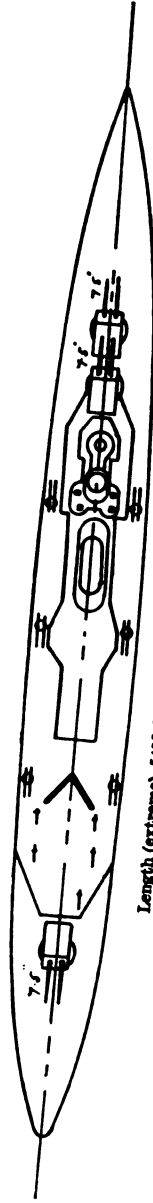
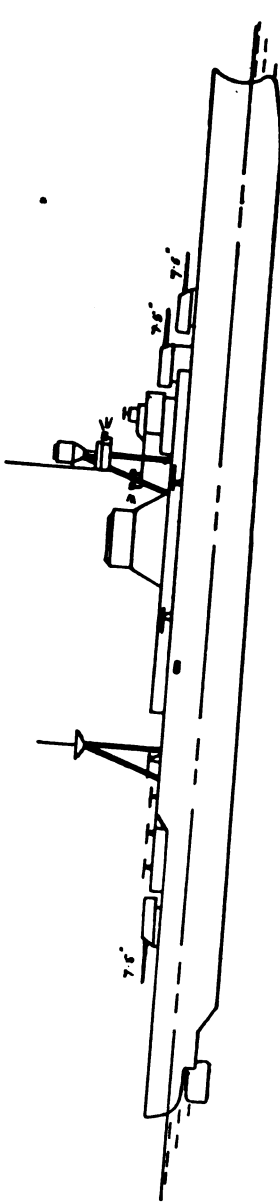
Length (extreme), 585 ft. ; Length on W. L., 575 ft. ; 27,940 tons ; Speed, 22½ knots ; Completed, 1914-15,
 Armament, 12-12-in. ; 12-6-in. ; 4-3-in. A.A. ; 6 M. ; 4 L. ; 2 submerged 21-in. torpedo tubes.
 Guns on B and X turrets replaced by rangefinders.

ARGENTINA.

CRUISERS.

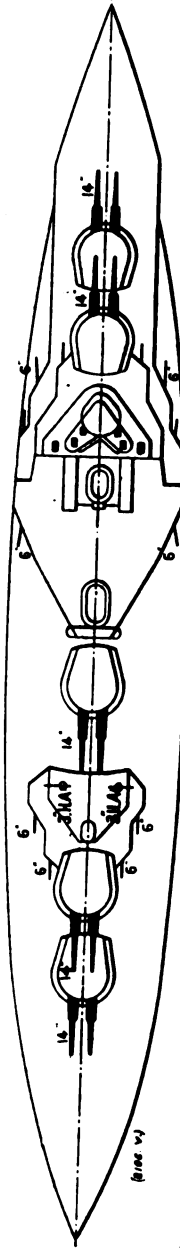
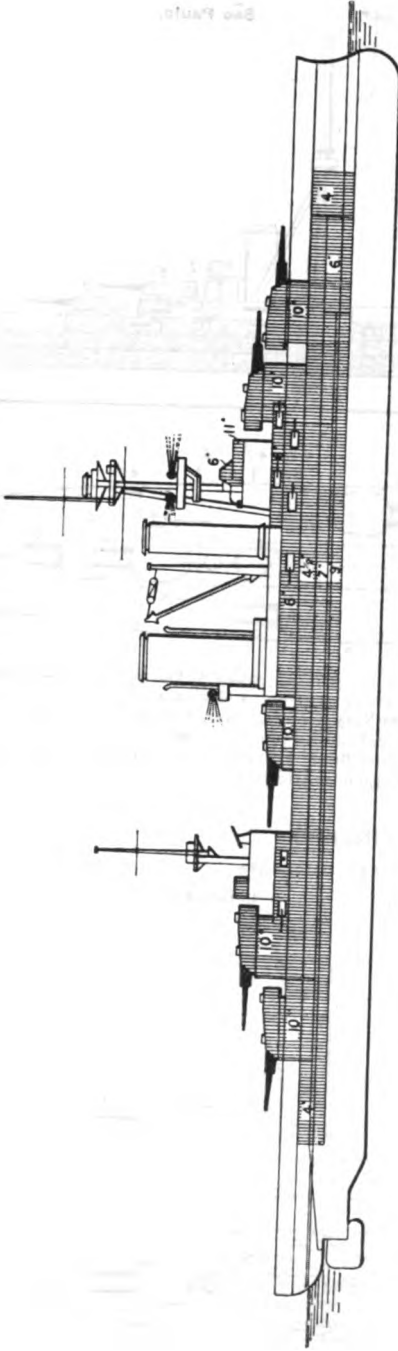
Almirante Brown.

Vinticinco de Mayo.



Length (extreme), 543 ft.; 6,408 tons; Speed, 28 knots. Completed, 1897.
 Armament, 6—7.6-in.; 15—4-in. A.A.; 6 Pom Poms; 6—21-in. torpedo tubes
 1 catapult; 2 seaplanes.
 Corrections to plan.—Fore topmast shortened. Main topmast lengthened. Searchlight fitted on mainmast. Superstructure built aft side of mainmast. Derrick fitted on fore side of mainmast.

CHILE.
BATTLESHIP.
Almirante Latorre (formerly H.M.S. Canada).



Length (extreme), 661 ft. ; Length R.P., 625 ft. ; Standard Displacement, 23,960 tons ; Speed, 23 knots ; Completed 1916 ; Modernised at Devonport Dockyard, 1929-31. •
Armament, 10-14-in. ; 14-6-in. ; 4-3-pr. ; 4 submerged 21-in. torpedo tubes ; 1 catapult.
• During modernisation main topmast has been raised and bridge platforms extended.

Four 4-in. A.A. have been added.
Catapult fitted on quarter deck.

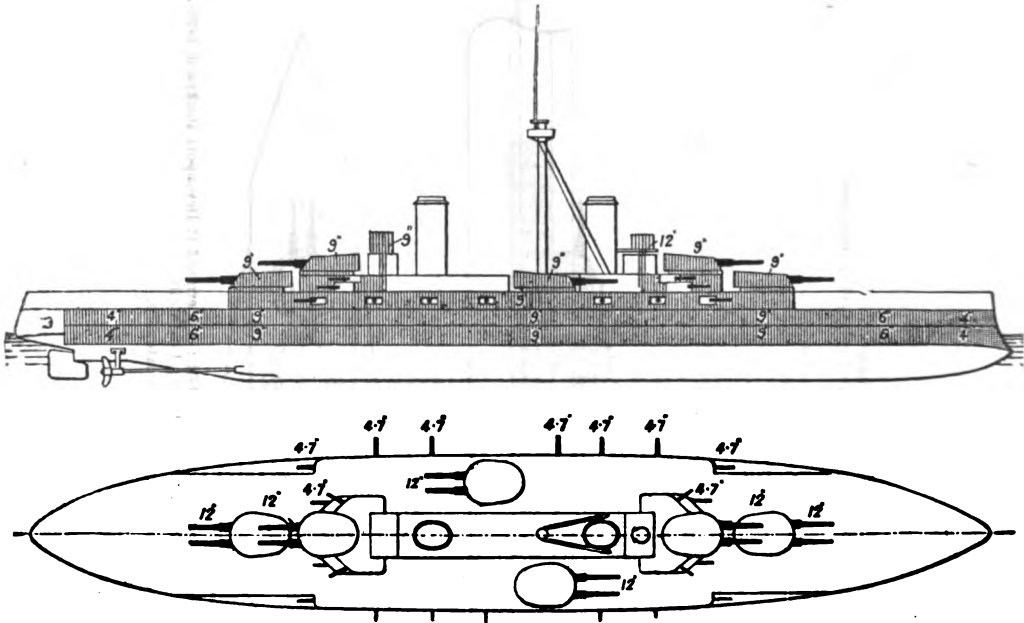
(P54)

BRAZIL.

BATTLESHIPS.

Minas Geraes.

São Paulo.



Length (extreme), 543 ft. ; Length B.P., 500 ft. ; 19,200 tons ; Speed, 21 knots ; Completed, 1909, 1910.

Armament, 14—12-in. ; 14—4.7-in. ; 2—3-pr. ; 4—3-in. A.A. ; 8 M. A.A.

Overhauled and refitted at Brooklyn Navy Yard, 1921-23, and A.A. guns installed.

Corrections to plan.—Ten main deck 4.7-in. guns removed in 1931.

Forward funnel removed, bridgework modified ; 4.7-in. guns and 3-in. A.A. guns added.

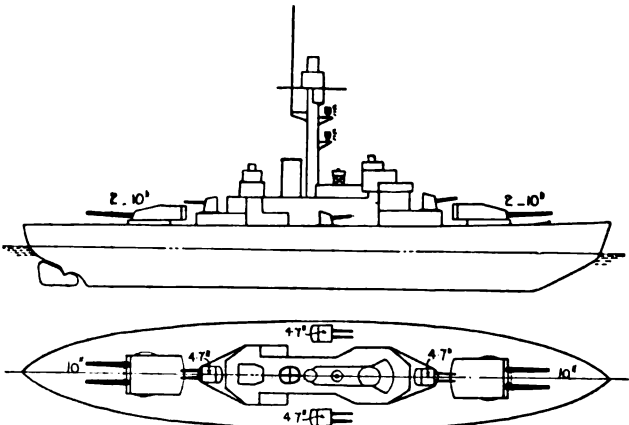
Polemast and rangefinder fitted abaft funnel.

FINLAND.

ARMoured GUNBOATS.

Väinämöinen.

Ilmarinen

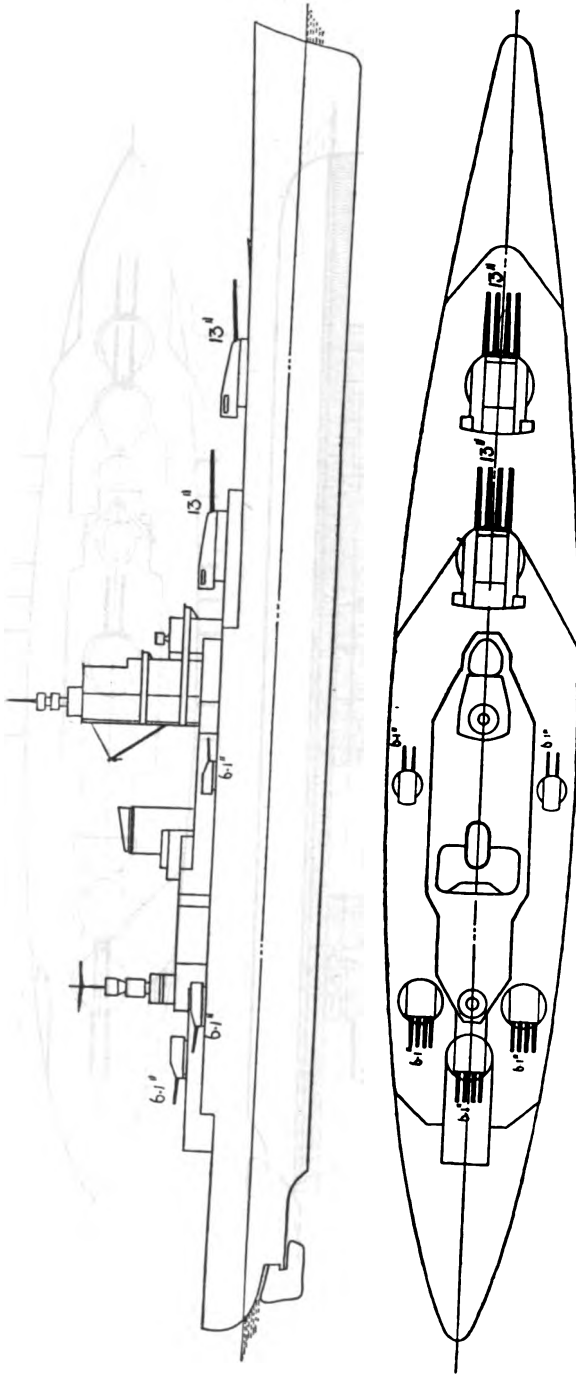


Length, 805 ft. ; 3,900 tons ; Speed, 15 knots.

Armament, 4—10-in. ; 8—4-in.

Completed, 1932-33.

FRANCE.
BATTLESHIPS.
Dunkerque. Strasbourg.

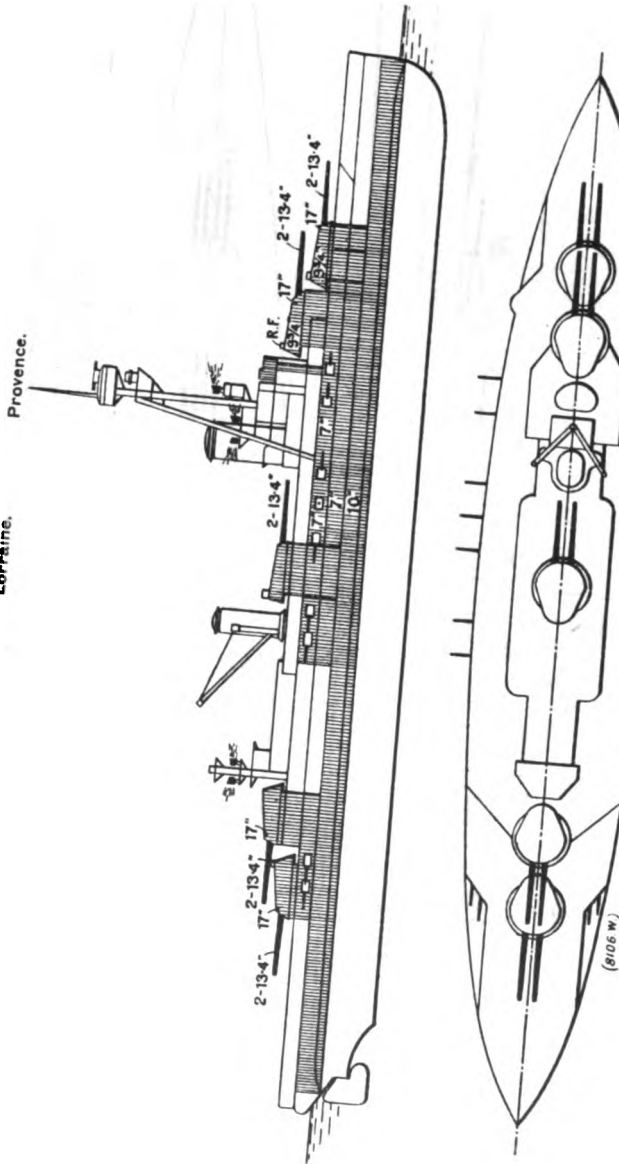


Length, 708 ft.; 28,500 tons; Speed, about 29 knots. Completed, 1936.
Armament, 8—13-in.; 16—5·1-in., 40 smaller; 1 catapult; 4 aircraft.
Catapult fitted on quarter deck at M.L., and crane fitted on port side at break of deck.

FRANCE.

BATTLESHIPS.

Bretagne.



Length (extreme), 544 ft. 6 ins.; 22,189
Armament, 10-13.4-in.; 14-5.4-in.; 8-3.5-in. Con-

Correction to plan m. ; 3-3-lh. A.A. ; 5-3-pr. ; 2-1-pr. ; 4 submerged v.

NOTE.—Lorraine has been reconstructed. The midships have now tall main topmasts and no fore topmasts. Improved protection is fitted. 8—3-0.10.
Correction to plan.—The ships have now tall main topmasts and no fore topmasts. 4 seaplanes. 1 catapult.
Corrections to plan.—1 pr.; 2-1 pr.; 4 submerged 18-in. torpedo tubes. 4 seaplanes. 1 catapult.
Corrections to plan.—1 pr.; 2-1 pr.; 4 submerged 18-in. torpedo tubes. 4 seaplanes. 1 catapult.

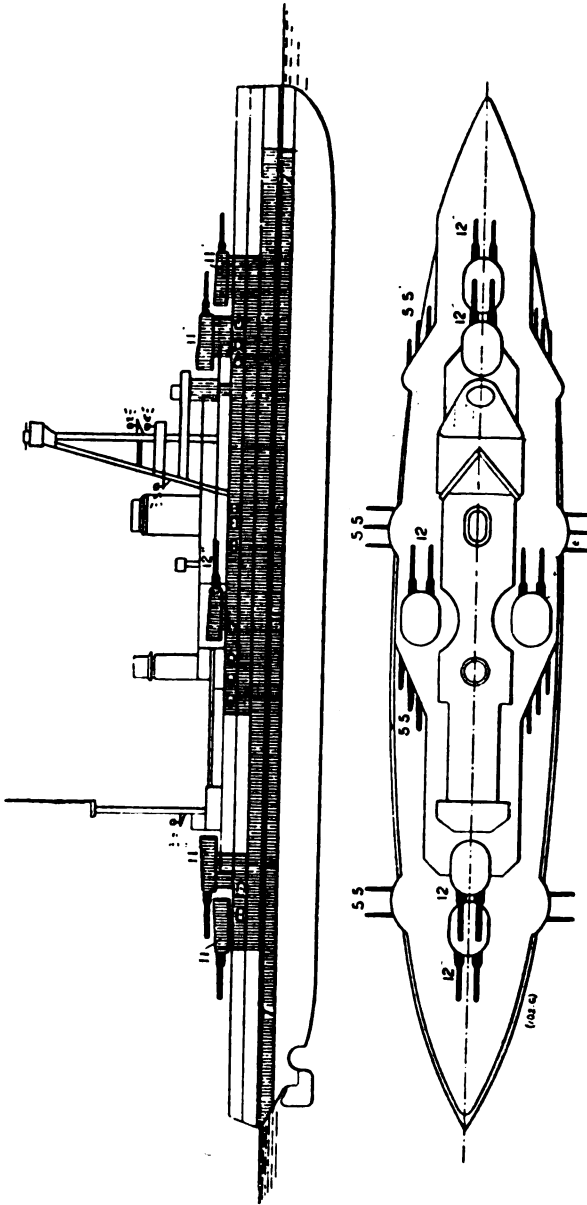
8-3-9-in. A.A. fitted in lieu of 2-13-4-in. guns removed. Cranes fitted abreast funnel. Bridgework extended. Machinery is modernised.

FRANCE.

BATTLESHIPS.

Courbet.

Paris.



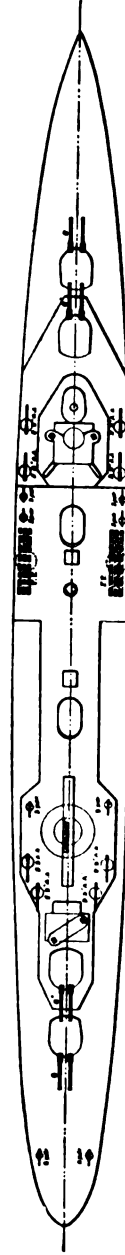
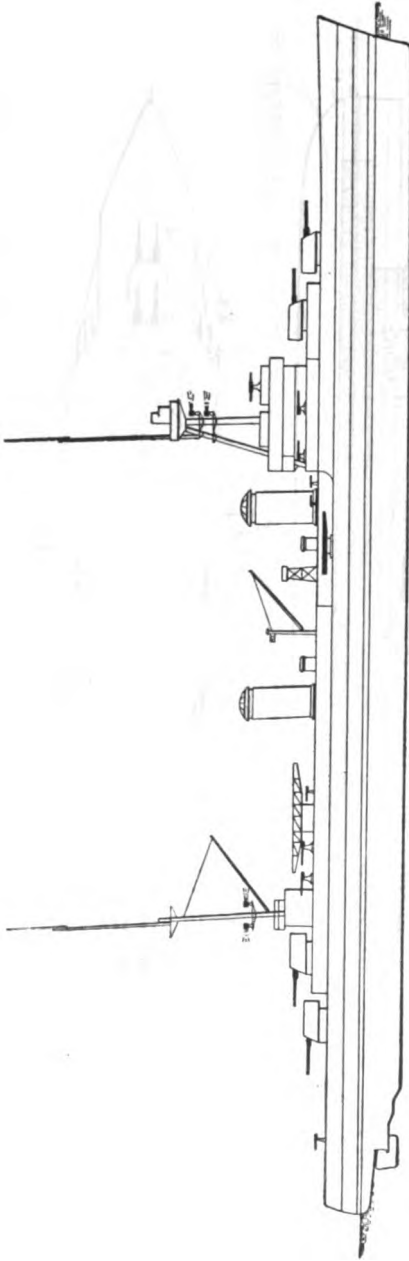
Length (extreme), 561 ft. ; Length B.P., 641 ft. 4 ins. ; 22,180 tons ; Speed, 30 knots ; Completed, 1913-14. Modernised in 1922.
 Armament, 19-12 in. ; 22-5.4 in. ; 7-3 in. A.A. ; 2-3-pr. ; 2-1-pr. ; 4 submerged 18-in. torpedo tubes.

Corrections to plan.—Crane fitted abreast after funnel. After funnel reduced in height. Range-finder fitted on B turret.
 Courbet and Paris are under the control of the Free French.

FRANCE.

CRUISERS.

Duquesne.	Tourville. ("Duquesne" Class.)	Suffren.	Colbert.	Foch.	Dupleix. ("Suffren" Class.)
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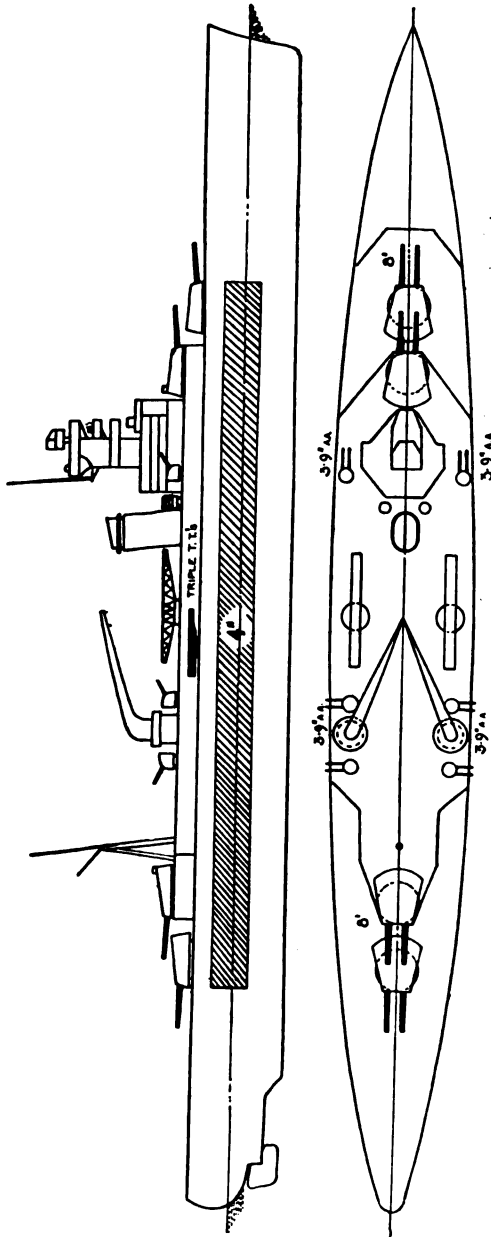
Length (between perpendiculars), 607 ft. (Duquesne and Tourville (extreme), 626 ft. 8 ins.); 10,000 tons; Speed, 32 knots (Duquesne and Tourville, 33-2 knots). Armament, 8-8-in., 8-8-in. A.A. (Dupleix, Colbert and Foch have 8-8-in. A.A.); 8-1-pr.; 2-triple 21-in. T.T.'s. 2-3 seaplanes.

The above plan is for Duquesne and Tourville. The others differ slightly from this in details of bridges, cranes, catapulta, etc. Suffren has 2 catapulta in the position shown above. Colbert, Dupleix and Foch have tripod mainmasts, 2 catapulta between the funnels and the two cranes abreast the after funnel; fore topmasts removed in Dupleix and Colbert, and shortened in Duquesne, Tourville and Foch.

FRANCE.

CRUISER.

Algérie.



Length (extreme), 610 ft. 3 ins.; 10,000 tons; Speed, 31 knots.

Armament, 8—8-in.; 12—3-9-in. A.A.; 8—1-5-in.; 16 M.;

1 catapult; 2 seaplanes.

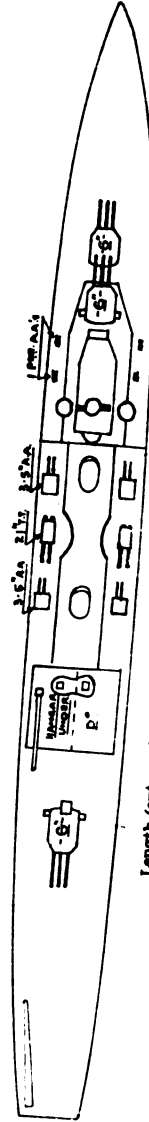
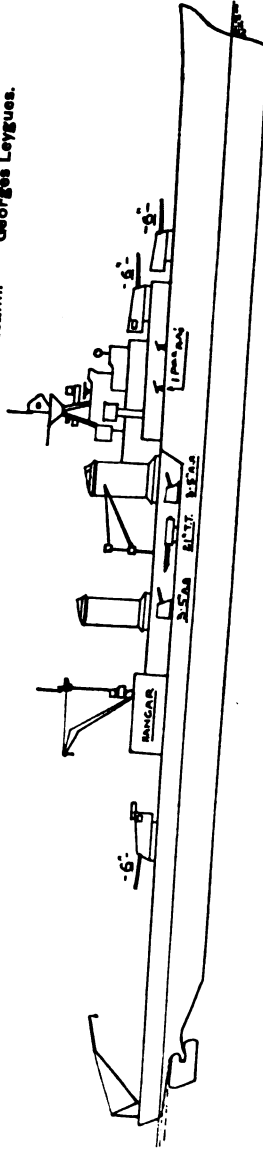
Correction to plan.—The aircraft cranes are not sided as shown, but lie fore and aft from a structure on the middle line between funnel and mainmast.

Superstructure amidships modified and two cranes fitted.

FRANCE.

CRUISERS.

Jean-de-Vienne. La Galissonnière. Marsellaise. Gloire. Montcalm. Georges Leygues.



Length (extreme), 580 ft.; 7,000 tons; Completed, 1905-07; Speed, 31 knots.
 Armament, 9-6-in.; 8-8-in. A.A.; 8-5 in. A.A.; 4-21-7-in. torpedo tubes; 4 seaplanes; 1 catapult.

Fitted with Hein landing canvas at the stern.
 Catapult fitted on after turret.

FRANCE.

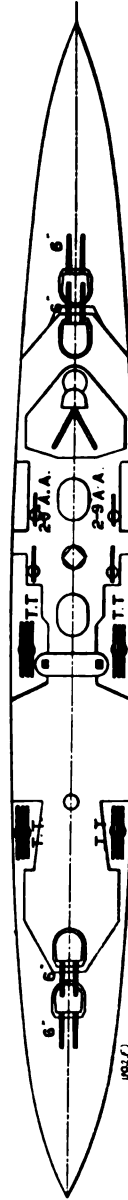
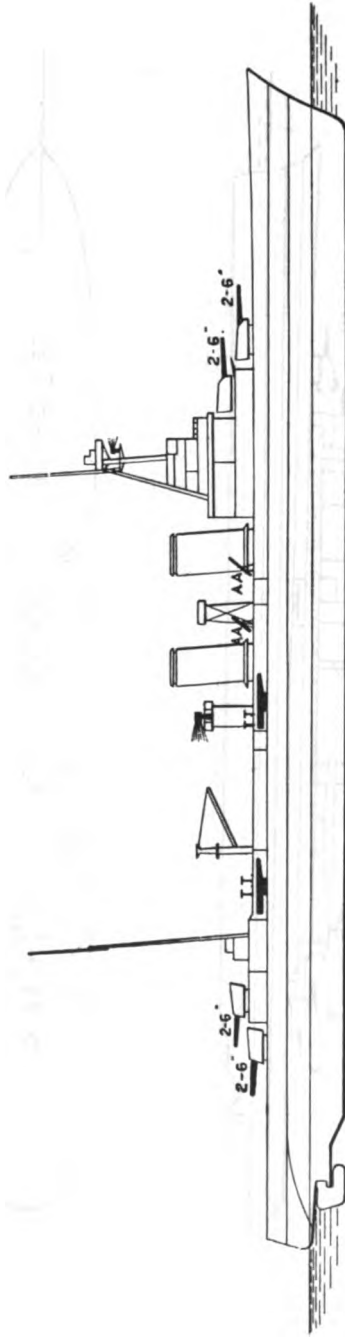
CRUISERS.

"Duguay-Trouin" Class.

La Motte Picquet.

Duguay-Trouin.

Primauguet.



Length (extreme), 594 ft. 10 ins. ; Length B.P., 575 ft. ; 7,249 tons ; Speed, 34 knots. Completed, 1926-27.
 Armament, 8-6.1-in. ; 4-5-in. A.A. ; 2-3-pr. ; 4 M. ; 1 L. ; 4 triple torpedo tubes (21.7-in. torpedoes) ; 1 catapult ; 1 seaplane.

NOTE.—Reported to have protection to magazines.

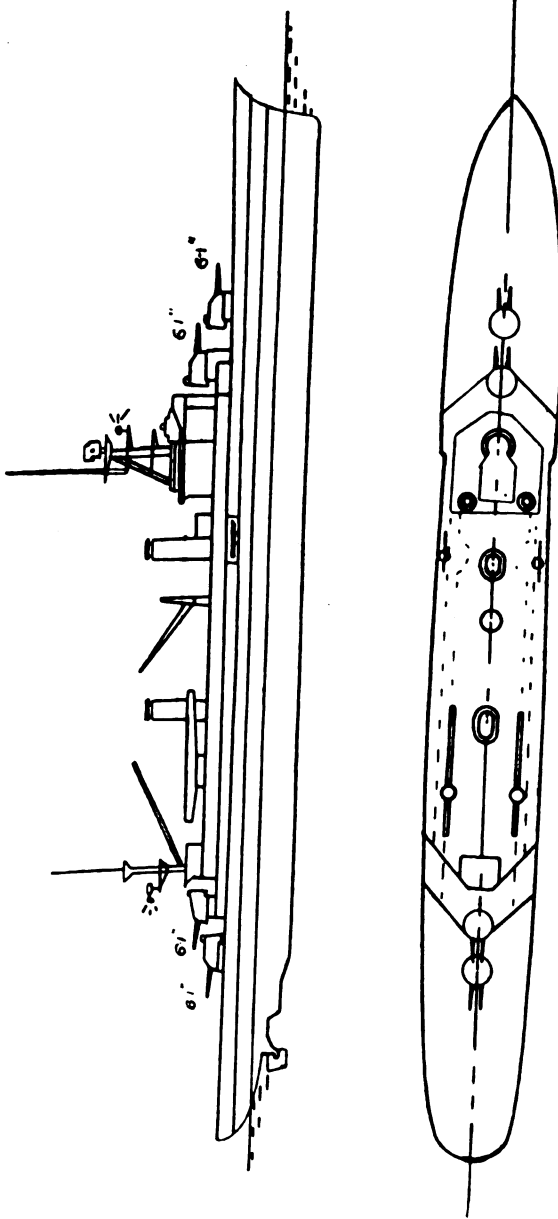
Correction to plan.—Catapult is fitted on quarter deck.

Fore topmast removed and masthead modified.

FRANCE.

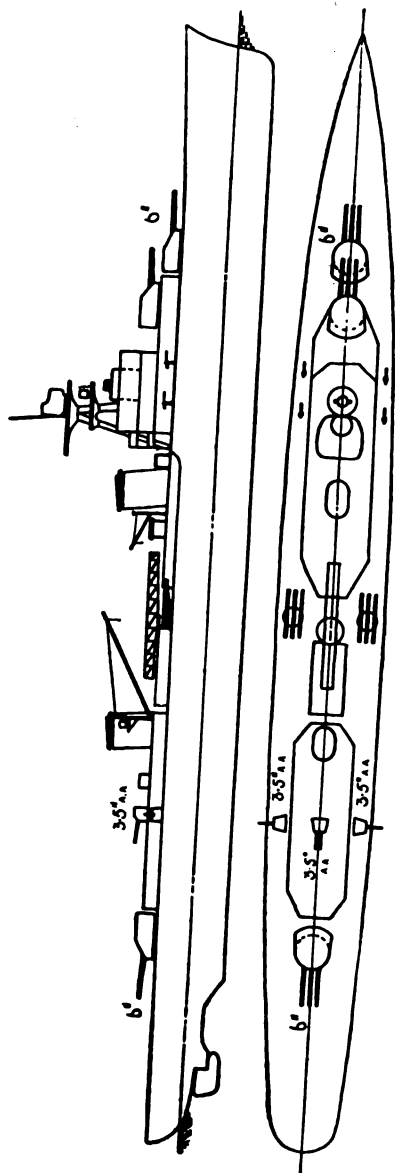
TRAINING CRUISER.

Joanne d'Arc.



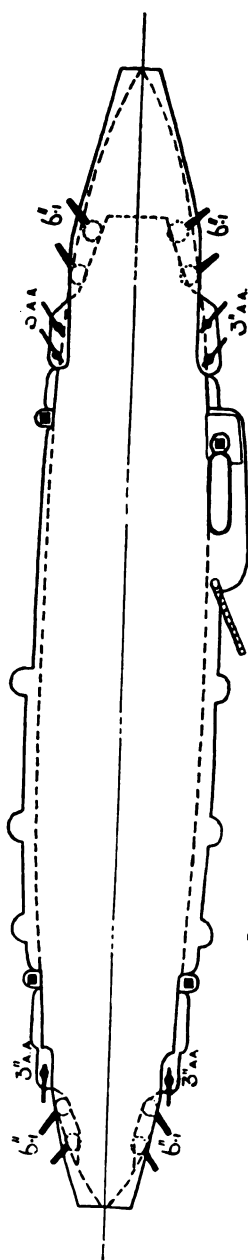
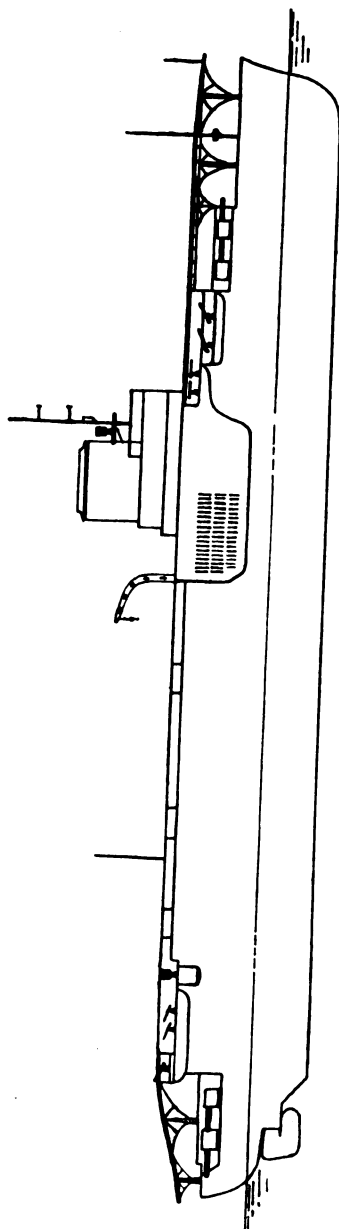
Length (extreme), 537 ft. 8 ins.; 6,498 tons; Speed, 28 knots; Completed, 1931.
Armament, 8—6" 1-in.; 4—3-in. A.A.; 2—1" 5-in.; 2 M.; 2—21" 7-in. torpedo tubes;
2 casemates.
Correction to—

FRANCE.
CRUISER MINELAYER.
Emilé Bertin.



Length (extreme), 580 ft. 9 in.; 5,386 tons : Speed, 34 knots. Completed, 1894.
Armament, 9-6-in. : 4-3-6-in. A.A. : 4-1-5 A.A. : 8 M. : 200 mines : 6-21-7-in. torpedo tubes : 1 catapult; 2 aircraft.
Correction to plan.—Small pole must fitted on fore side of after turret.

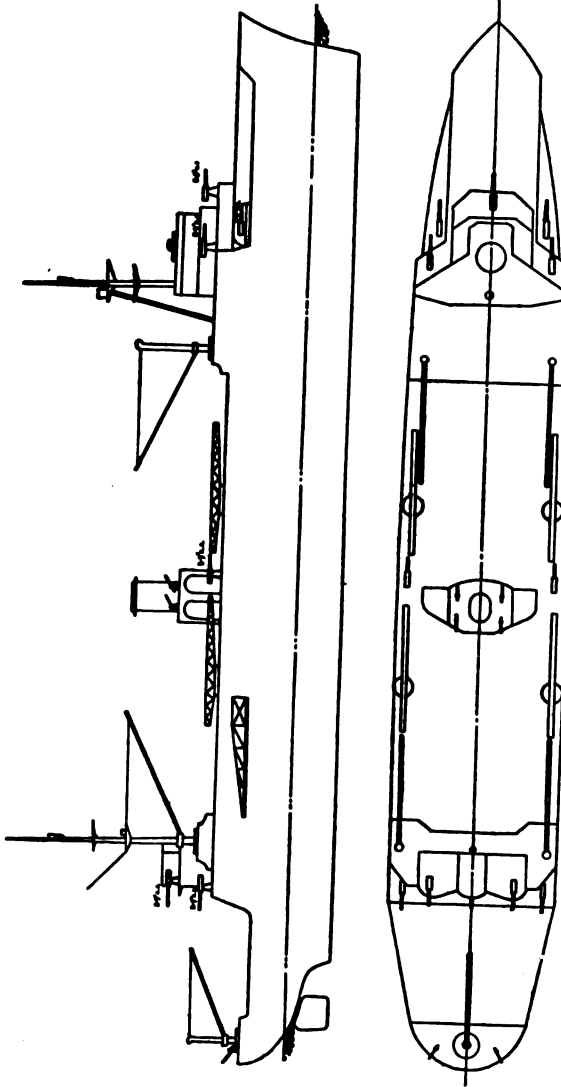
FRANCE.
AIRCRAFT CARRIER.
Béarn.



Length (extreme), 599 ft. ; 23,146 tons ; Speed, 21.5 knots ; Completed, 1923.
Armament, 8—6.1-in. ; 6—3 in. A.A. ; 8—1-pr. A.A. ; 12 M. A.A. ; 4—21.7-in. torpedo tubes ; 41 planes.

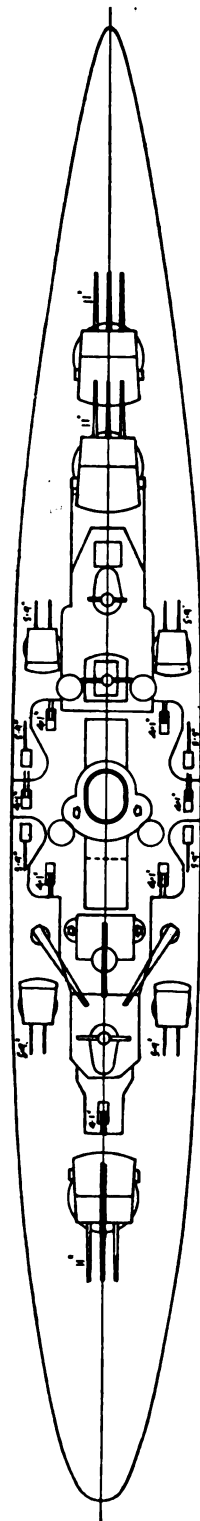
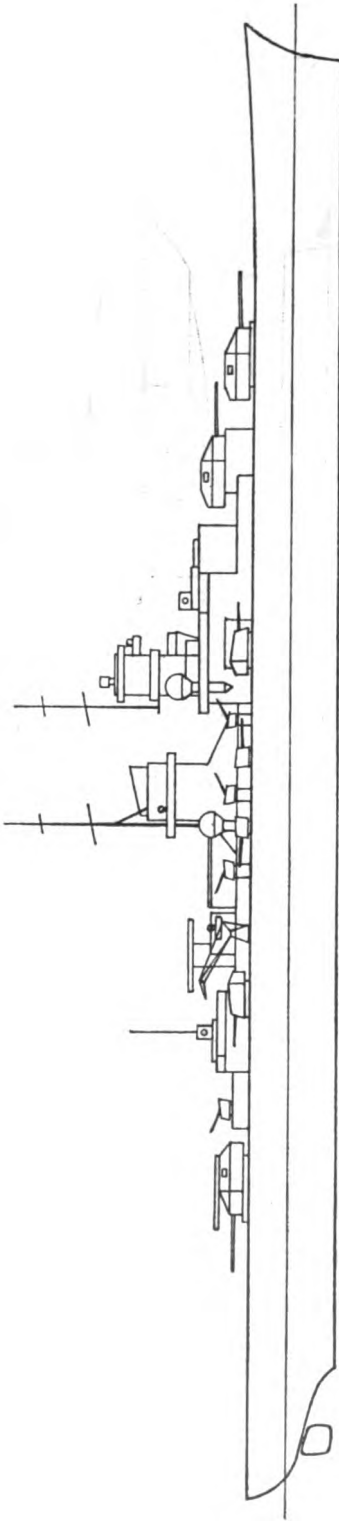
Correction to plan.—Space between flight deck forward and upper deck partially blanked off. Framework fitted to after-side of funnel. ;

FRANCE.
AVIATION TRANSPORT.
Commandant Teste.



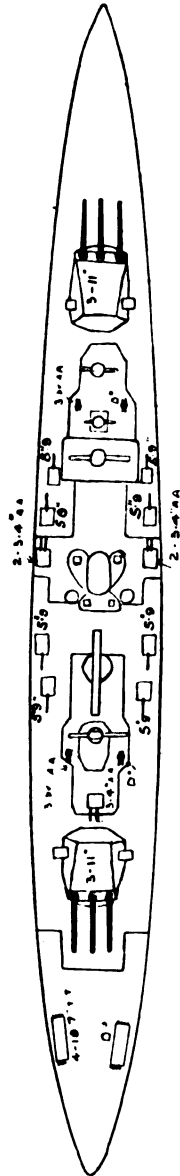
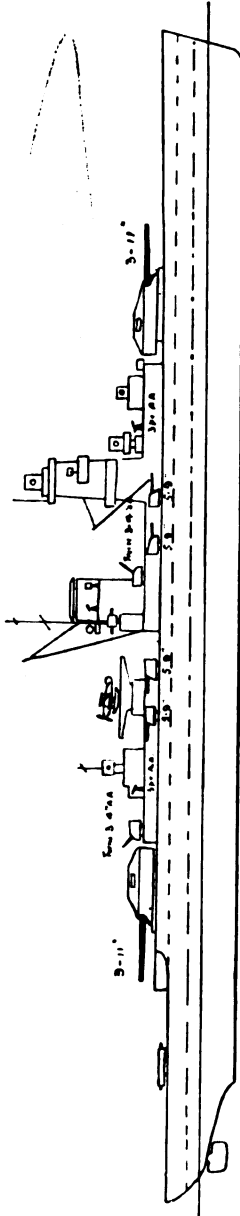
Length (extreme), 548 ft. 10,000 tons; Speed, 20½ knots; Completed, 1932.
Armament, 12-3-9-in. A.A.; 18-3-pr. A.A.; 12 M.; 19 planes.

GERMANY:
BATTLE CRUISERS.
Scharnhorst. Gneisenau.



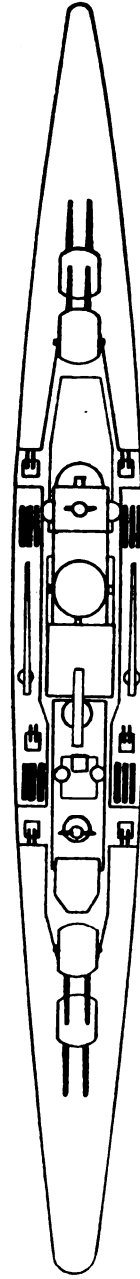
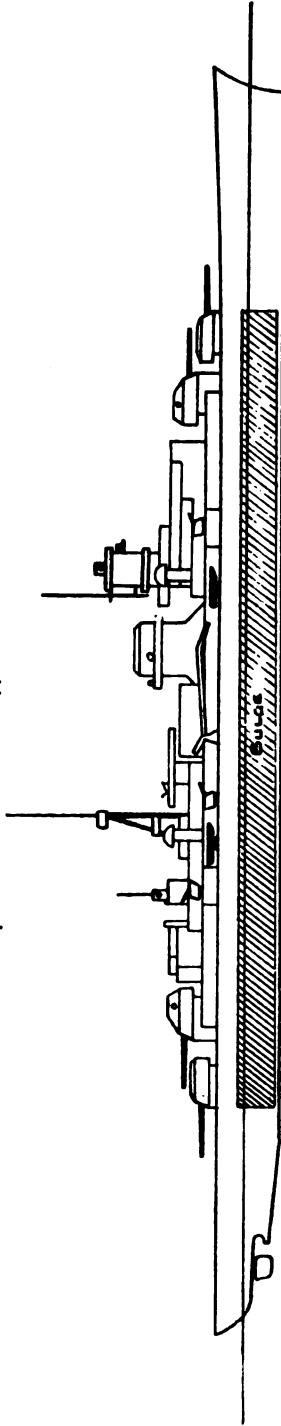
Length (extreme), 741 ft. 6 ins.; 26,000 tons; 27 knots; Completed 1935-36.
Armament, 9—11-in.; 12—5.9-in (4 twin turrets, 4 single mountings); 16—4.1-in. A.A.; 16—1.5-in. A.A.; 4 aircraft; 2 catapults.

GERMANY.
ARMoured SHIP.
Admiral Scheer.



Length (extreme), 609 ft. 3 ins. ; Standard displacement, 10,000 tons ; Speed, 26 knots.
Armament, 6-11-in. ; 8-5-8-in. ; 8-4-1-in. A.A. ; 8-1-5-in. A.A. ; 10 M.G. ; 8-81-in. torpedo tubes ; 1 catapult ; 2 aircraft.
Completed, 1924.

GERMANY.
CRUISER.
Admiral Hipper.

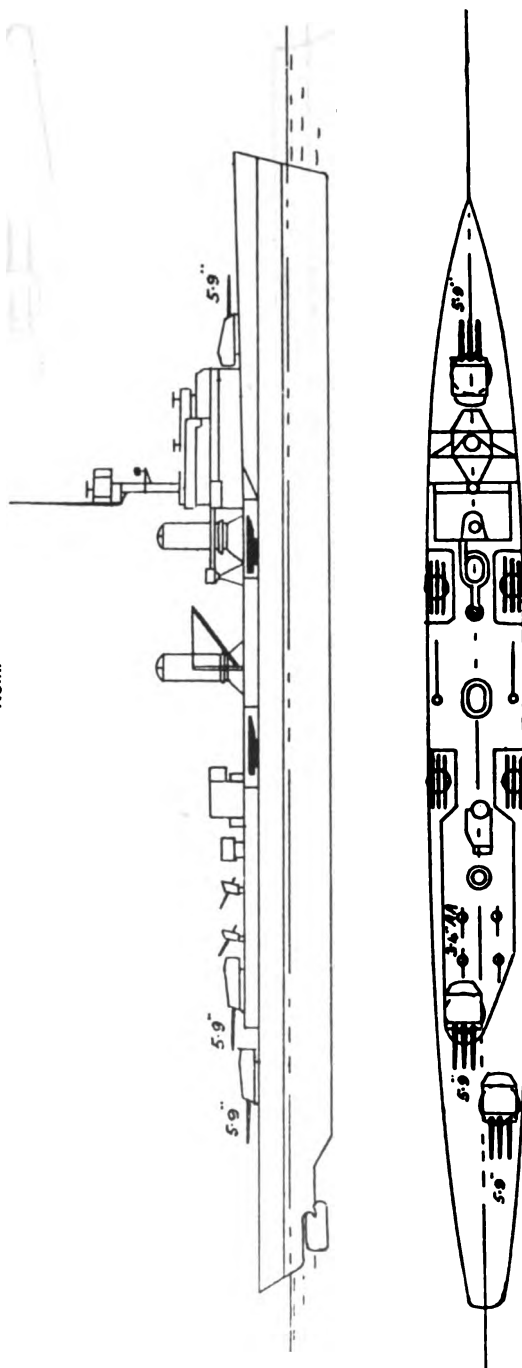


Length (on W.L.), 639 ft. 9 ins. : Standard displacement, 10,000 tons : Speed, 32 knots : Completed, 1939.
Armament, 8-8 in. ; 12-4'1 in. A.A. ; 12-1'45 A.A. ; 12-21-in. torpedo tubes ; 1 catapult ; 3 aircraft.
Stem is upright.

GERMANY.

LIGHT CRUISER.

Köln.

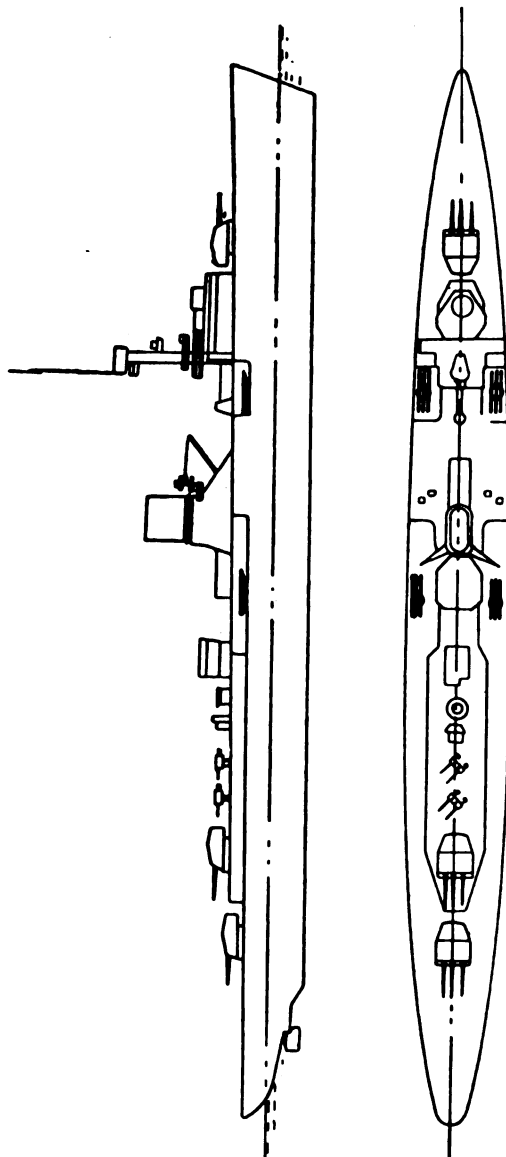


Length (extreme), 570 ft. 10 ins. ; 6,000 tons ; Speed, 32 knots ; Completed, 1923-24.

Armament, 9—5.9-in. ; 4—3.5-in. A.A. ; 4 triple 21-in. torpedo tubes ; 1 catapult ; 2 aircraft.

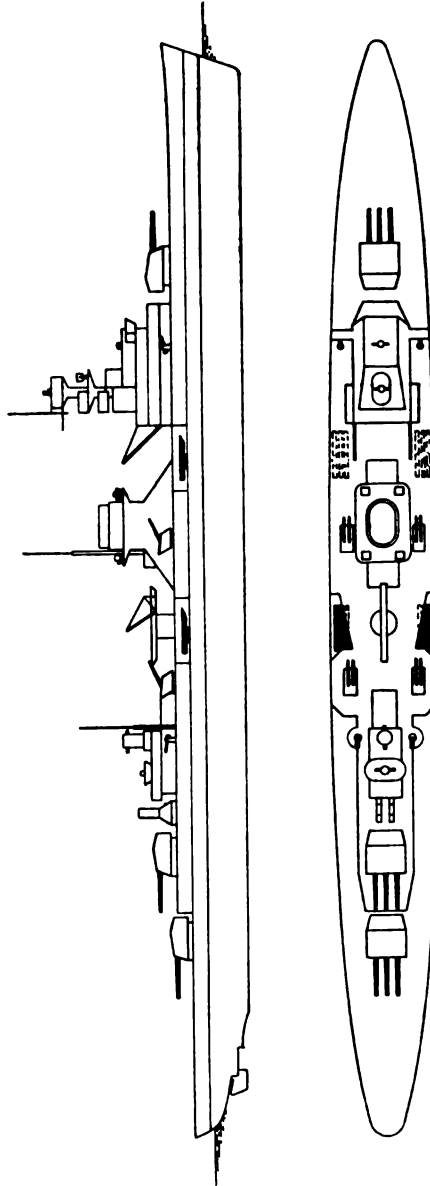
Pole mainmast fitted on aft side of funnel. Catapult fitted between funnels. Crane fitted in lieu of derrick on port side.

GERMANY;
LIGHT CRUISER,
Leipzig



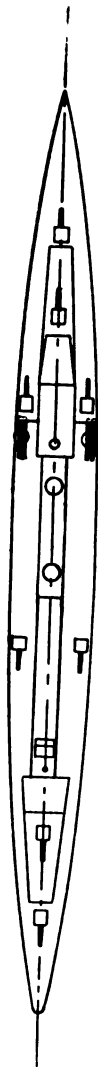
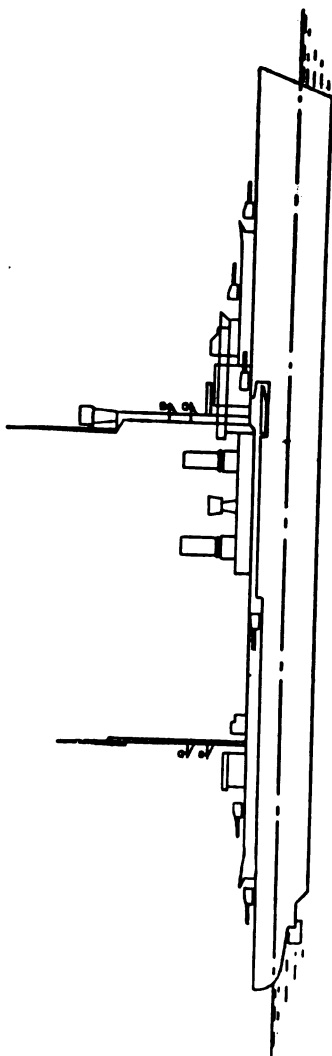
Length (extreme), 531 ft.; Length W.L., 543 ft. 10 ins.; 6,000 tons; Speed, 32 knots; Completed, 1931.
Armament, 9—5½-in.; 8—3½-in. A.A.; 8—1½-in. A.A.; 4 triple 21-in. torpedo tubes; 1 catapult; 2 aircraft.
Corrections to plan.—Fore mainmast fitted on aft side of funnel. Catapult fitted between funnel and foremast.
The derrick is fitted on the starboard side. A crane is fitted on port side nearest funnel. Fore topmast shortened.

GERMANY.
LIGHT CRUISER.
Nurnberg.



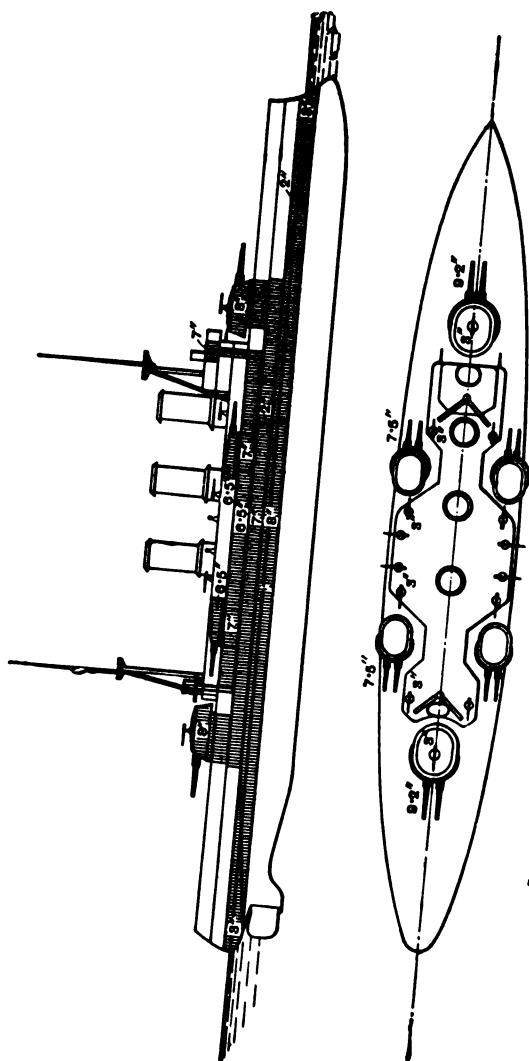
Length (on W.L.), 567 ft. 9 ins. ; 6,000 tons ; Speed, 32 knots ; Completed, 1935.
Armament, 9—6.9-in. 8—3.5-in. H.A. 8—1.5-in. A.A. 12—21-in. torpedo tubes ; 1 catapult ; 2 seaplanes

GERMANY.
LIGHT CRUISER.
Emden.



Length (extreme), 510 ft. 2 ins.; 5,400 tons; Speed, 29 knots; Completed, 1923.
Armament, 8—6.9-in.; 3—8.5-in. A.A.; 4 M.G.; 4—19.7-in. torpedo tubes in twin mountings.
The 6.9-in. guns are in twin mountings, 2 forward and 2 aft.
Corrections to plan.—Fore topmast shortened. Fore mast fitted to aft side of funnel.
Superstructure added before mainmast. Mainmast shortened and surmounted by a searchlight platform.

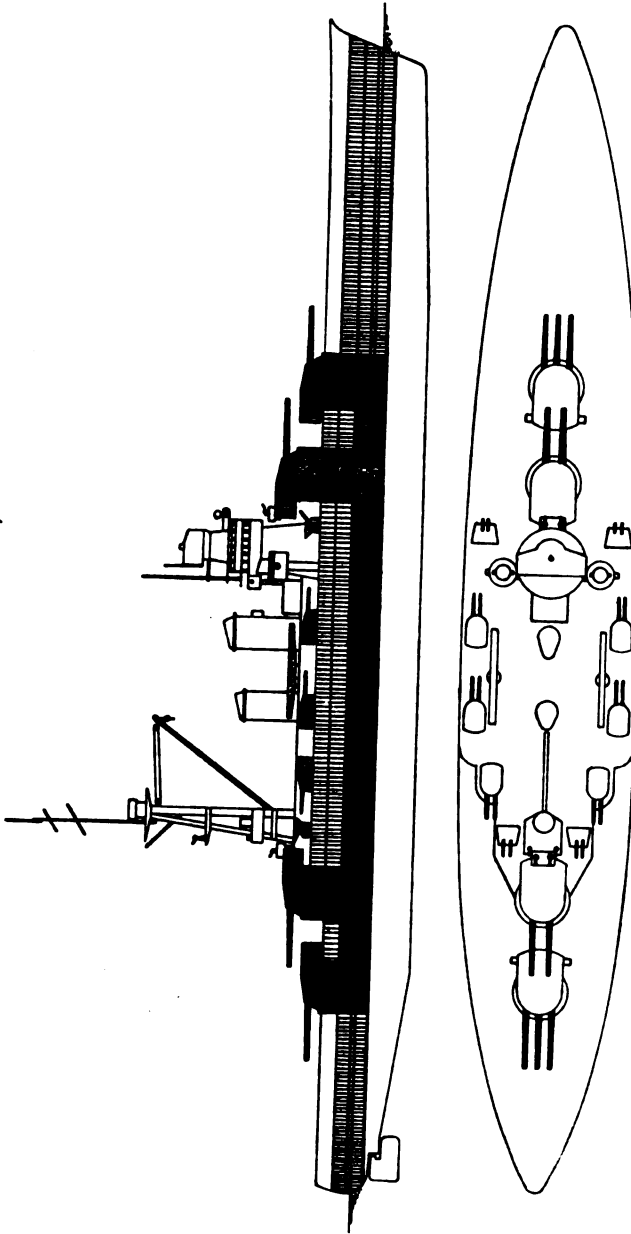
GREECE.
ARMoured CRUISER.
Giorgios Averoff.



Length, 432 ft. ; 9,201 tons ; Speed, 22.5 knots ; Completed, 1911. Refitted, 1927.
Armament, 4—9.2-in. ; 8—7.5-in. ; 16—3-in. ; 2—3-in. A.A. ; 4—8-pr. ; 2 M. ; 3 submerged 18-in. torpedo tubes.
Correction to plan.—Bridgework modified. Control top fitted on foremast. Searchlight and derrick fitted to mainmast.

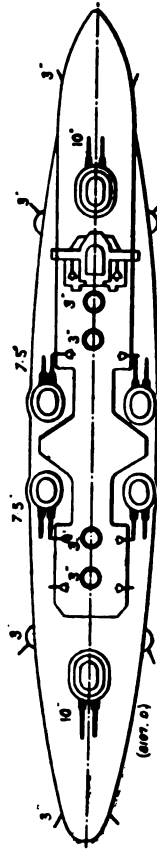
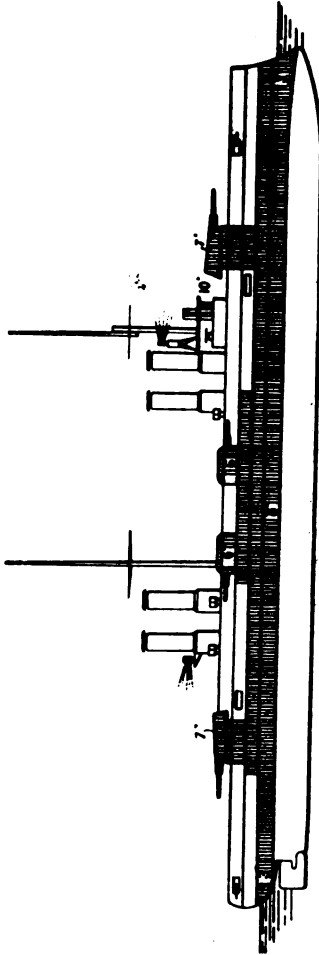
ITALY.**BATTLESHIPS.**

Conte di Cavour.	Andrea Doria.	Cale Dullio.
Giulio Cesare.	(After modernisation;)	



Length (extreme), 611 ft. 6 ins. ; 22,622 tons ; 27 knots ; Completed, 1914-15 ; Modernised, 1937.
 Armament { 10-12.6-in. ; 12-4.7-in. ; 8-5.9-in. A.A. ; 80 A.A. M.G. ; 4 aircraft ; 2 catapults in Cavour and Cesare.
 10-12.6-in. ; 12-5.8-in. A.A. ; 80 A.A. M.G. ; 1 aircraft ; 1 catapult in Doria and Dullio.
 Tripod mainmast removed in Doria.

ITALY.
CRUISER.*
S. Giorgio.



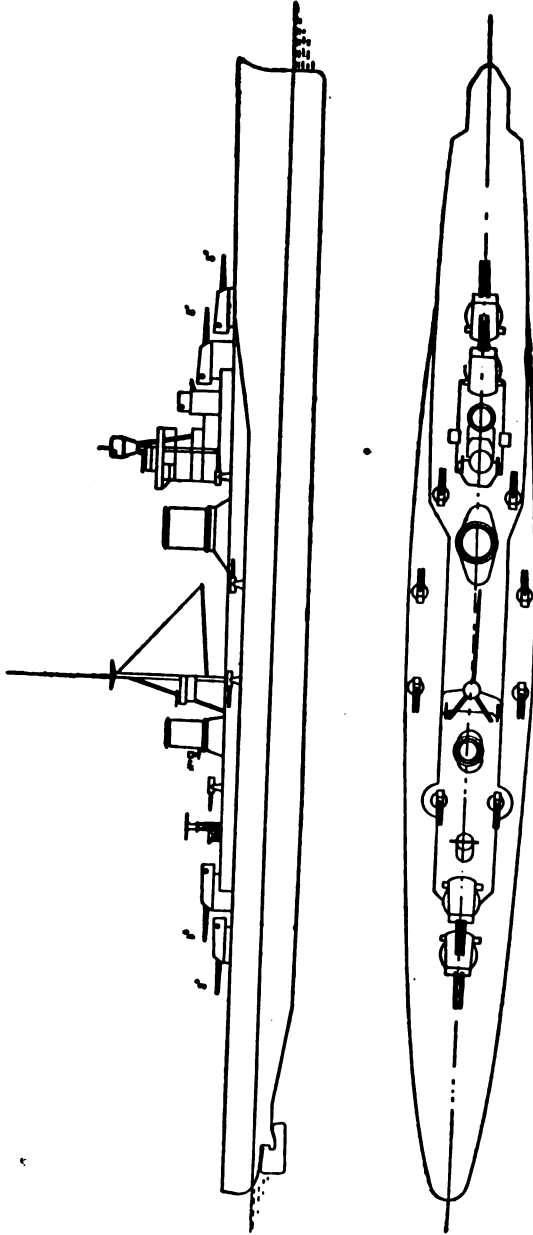
Length (extreme), 402 ft. 2 in. ; Speed, 22 knots ; 9,322 tons ; Completed, 1910.

Armament, 4—10-in. ; 8—7.5-in. ; 8—3.9-in. ; 2—3-pr. ; 6 M. ; 2 L. ; 2—18-in. torpedo tubes.

Correction to plan.—Foremast and aftermost funnels removed. Mainmast shortened.

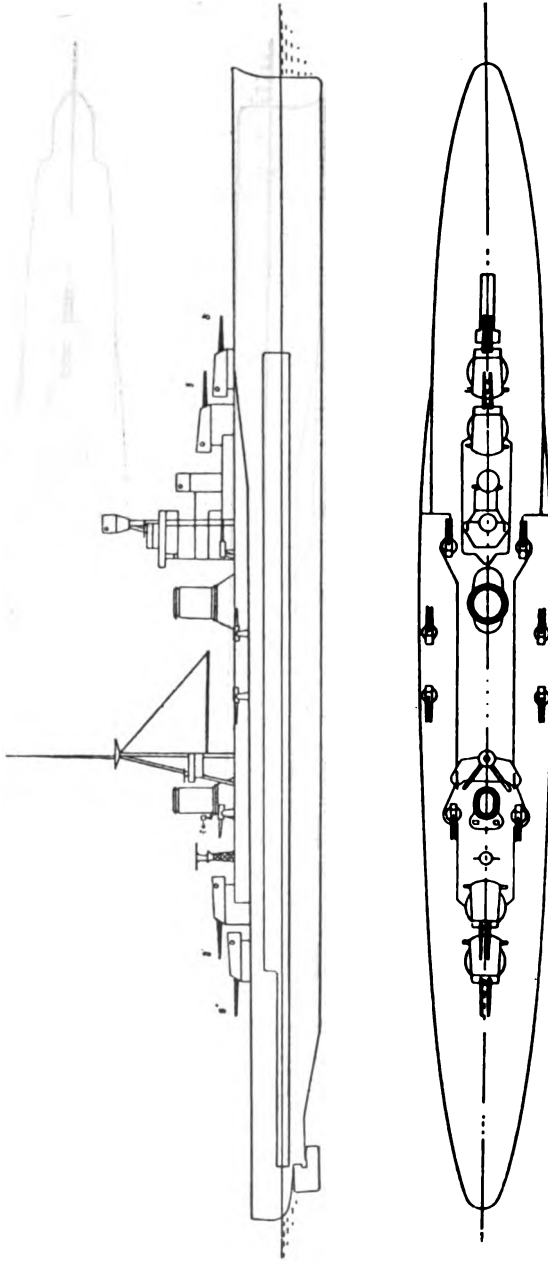
* Classified as a Battleship, 2nd class, in Italian official list.

ITALY.
CRUISER,
Modified "Trento" Class.
Bolzano;



Length (extreme), 646 ft. 3 in.; 10,000 tons; Completed, 1932; Speed, 35 knots.
Armament, 8—8-in. A.A.; 12—3.9-in. A.A.; 8—1.5 M. A.A.; 8—5 M. A.A.; 1 catapult; 2 aircraft; 8—21-in. torpedo tubes.
Corrections to plan.—Forward superstructure faired into funnel. Clinker screens fitted to funnels. Catapult fitted amidships.

ITALY.
CRUISER.
"Zara" Class.
Gorizia.

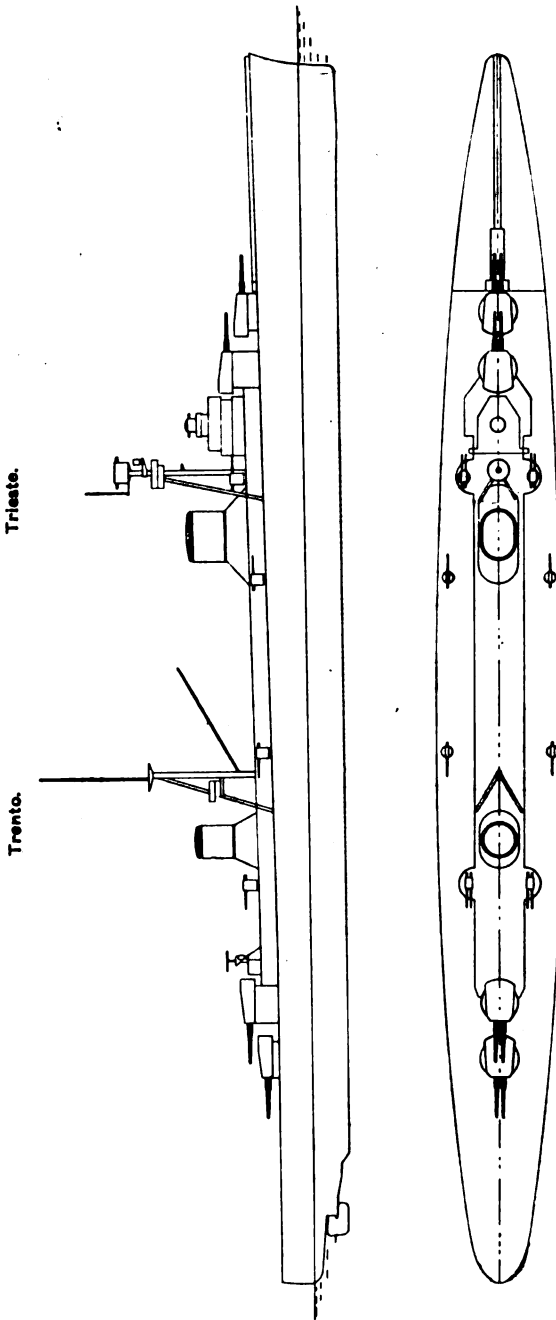


Length (extreme), 590 ft. 9 in. ; 10,000 tons ; Speed, 32 knots.
Armament, 8—8-in. ; 12—5-1/2-in. ; 8—1-1/2-in. A.A. ; 8—5 M.A.A. ; 1 catapult ; 2 aircraft.
Corrections to plan.—Forward superstructure faired into funnel. Clinker screens fitted to funnels.

ITALY.

CRUISERS.

"Trento" Class.



Length (extreme), 646 ft. ; 10,000 tons ; Speed, 28 knots ; Completed, 1920.

Armament, 8—8-in. ; 12—3.9-in. ; 4—1.67-in. A.A. ; 8—6 A.A. M.G. ; 4 twin torpedo tubes 21-in.
1 catapult ; 2 aircraft.

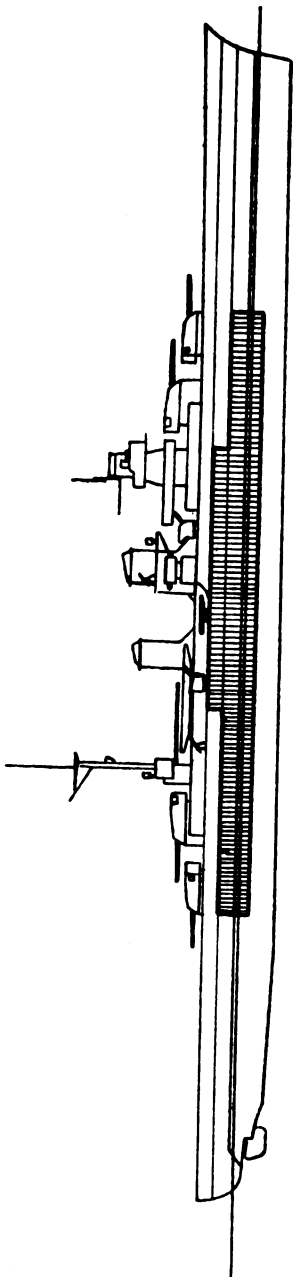
Correction to plan.—The 4-in. guns between the funnels are twin guns. Fore topmast removed. Bridgework extended.

ITALY.

CRUISERS.

Duca Degli Abruzzi.

Giuseppe Garibaldi.



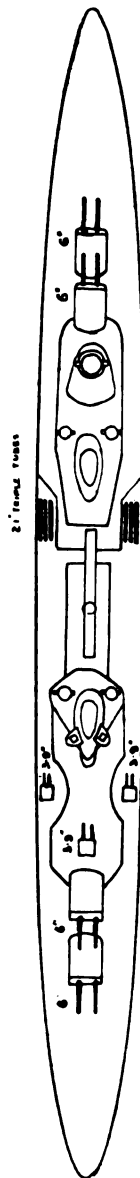
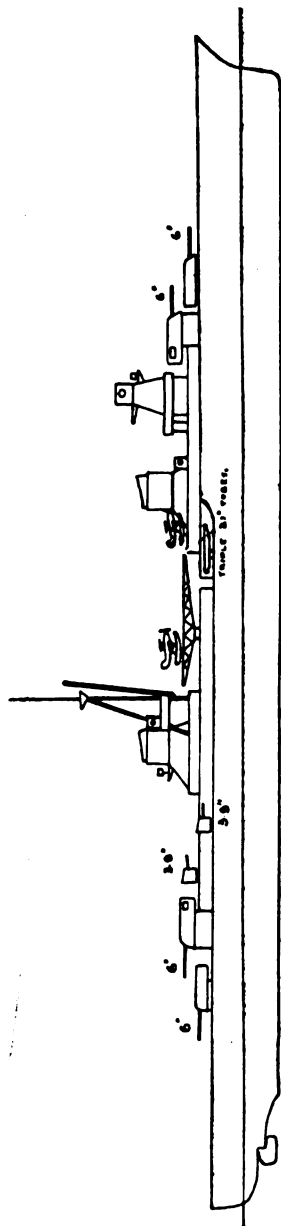
Length (extreme), 613 ft. 9 in.; Standard displacement, 7874 tons; Speed, 35 knots; Completed, 1936.
Armament, 10—6 in.; 8—8.9 in. A.A.; 8—1.5 in. A.A.; 6—31 in. torpedo tubes; 3 catapaults; 4 aircraft.

ITALY. CRUISERS.

"Attendolo" Class.

Eugenio di Savoia.

Filliberto Duca d'Aosta.



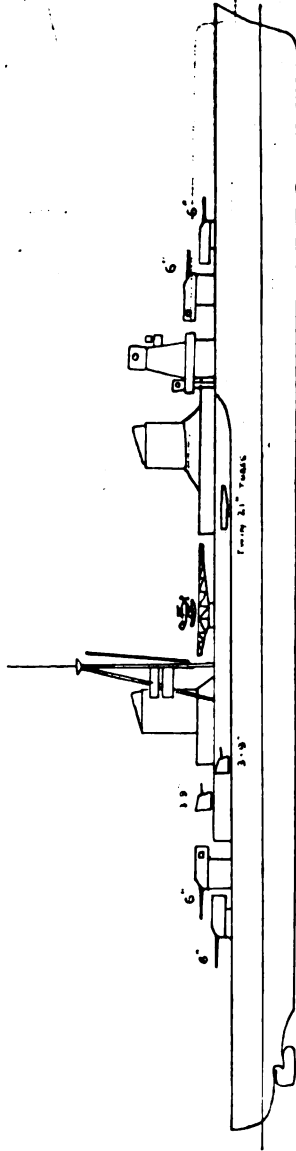
Length (extreme) 610 ft. 3 ins.; 7,330 tons; Speed, 36½ knots.
Armament, 8—6-in.; 8—3-1/2-in. A.A.; 3—6-in. A.A.; 3 triple 21-in. torpedo tubes; 1 catapult; 3 aircraft.

ITALY.
CRUISERS.

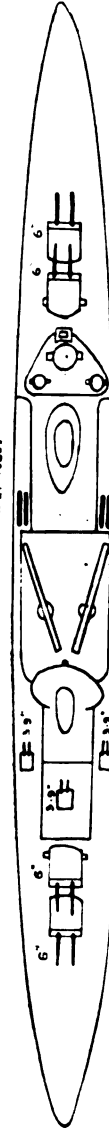
"Condottieri" Class.

Musio Attendolo.

Montecuccoli.



Plan 21' Turret



Length (extreme), 597 ft. 9 ins.; 6,941 tons; Speed, 37 knots; Completed, 1935.

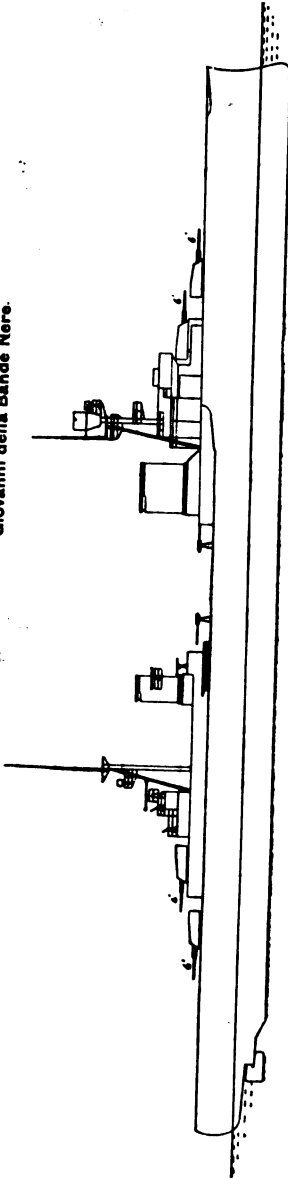
Armament, 8-6-in.; 6-8-9-in. A.A.; 8-1-6-in. A.A.; 8-5-in. A.A. M.G.; 2 twin 21-in. torpedo tubes; 1 catapult; 2 aircraft. Correction to plan.—1 catapult fitted on M.L.

ITALY.

CRUISERS.

"Condottieri" Class.

Armando Diaz.*
 Alberto di Gussano.
 Alberico di Barbiano.
 Luigi Cadorna.*
 Giovanni della Bande Nere.

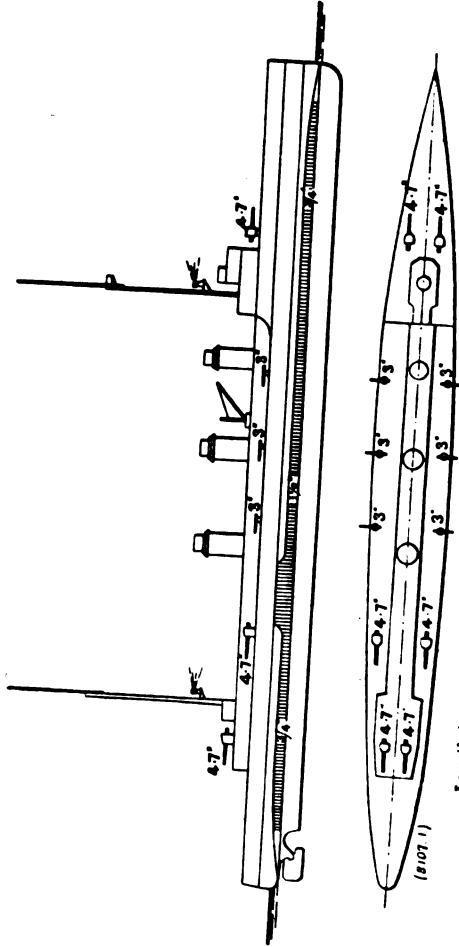


Length (extreme), 555 ft. 5 ins. ; 5,000 tons * (554 ft. 6 ins., 5,008 tons) ; Speed, 27 knots ; Completed, 1931-33.
 Armament, 8-6-in. ; 6-3.9-in. A.A. ; 8-1.5-in. A.A. ; 8-5 in. A.A. M.G. ; 4 torpedo tubes 21-in. ;
 1 catapult and 2 seaplanes.

Corrections to plan : The bridge and foremast have been modified. The after twin 3.9-in. A.A. gun is at the superstructure level on a raised platform. Fore topmast and stays to mainmast removed. Derrick fitted on forecastle of mainmast.

* In the Armando Diaz and Luigi Cadorna the mainmast is forward of the after funnel, the torpedo tubes are abreast the forward funnel, and the positions of the twin A.A. guns are reversed, the foremost gun being at forecastle deck level and the two after guns at upper deck level. The catapult is fitted between mainmast and X turret in Diaz and Cadorna ; on forecastle in other ships.

ITALY.
LIGHT CRUISER.*
Quarto.



Length (extreme), 431 ft. 9 ins. ; Speed, 28 knots ; Displacement, 2,903 tons ; Completed, 1913.
Armament, 6—4.7-in. ; 4—3-in. ; 2—1.57-in. A.A. ; 8 M. ; 2 above-water 18-in. torpedo tubes ; 138 mines.

* Classified as Scout in Italian official list.

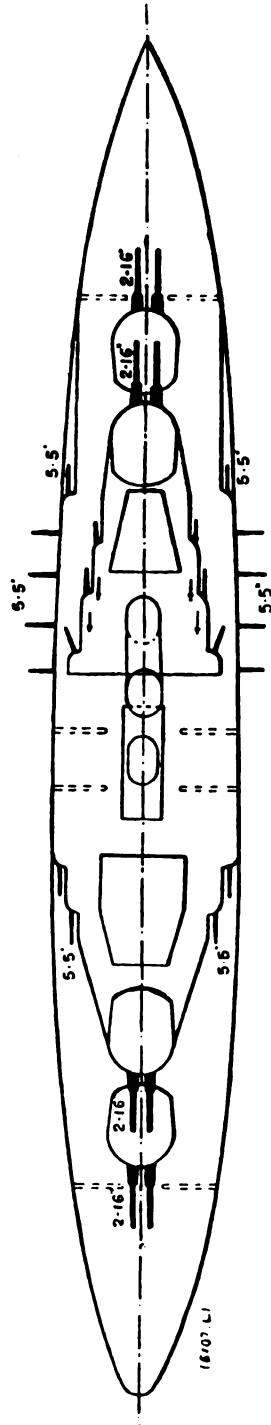
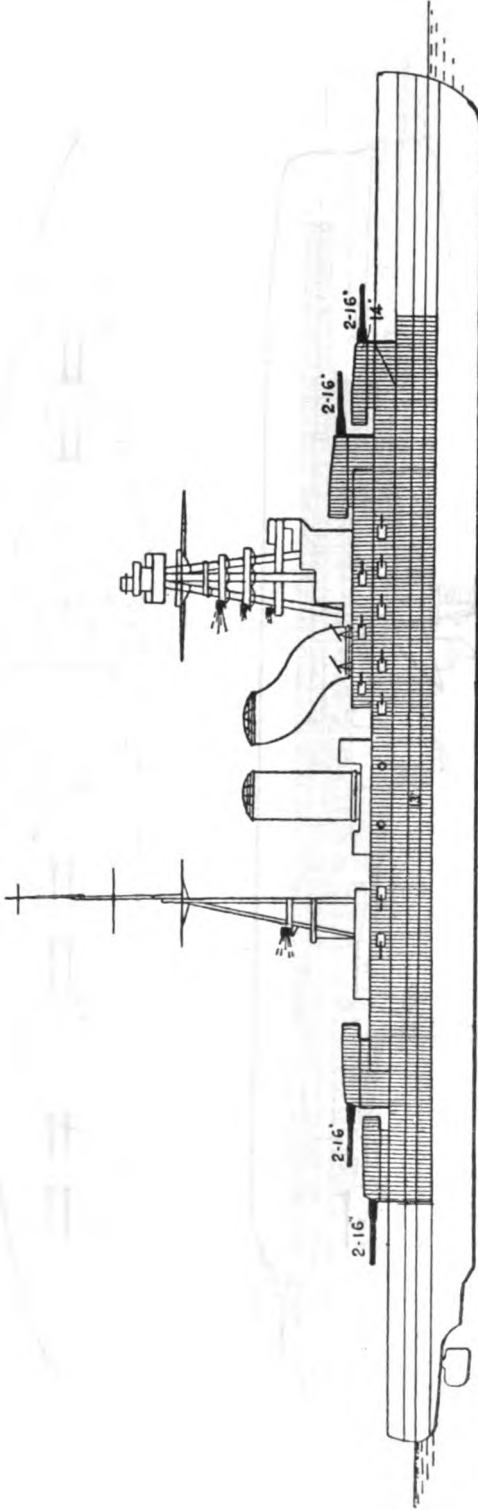
JAPAN.

BATTLESHIPS.

"Nagato" Class.

Nagato.

Mutsu.



Length (extreme), 700 ft.; Speed, 30 knots; 32,780 tons; Completed, 1920-1921.
 Armament, 8—16-in.; 20—6-in.; 8—5-in. A.A.; 8 M.A.A.; 1 catapult; 3 aircraft.
 These ships were reconstructed 1935-36, a single funnel being fitted and a catapult added between mainmast and "X" turret.
 Bridgework extended. Superstructure built round mainmast. Main topgallant mast removed.

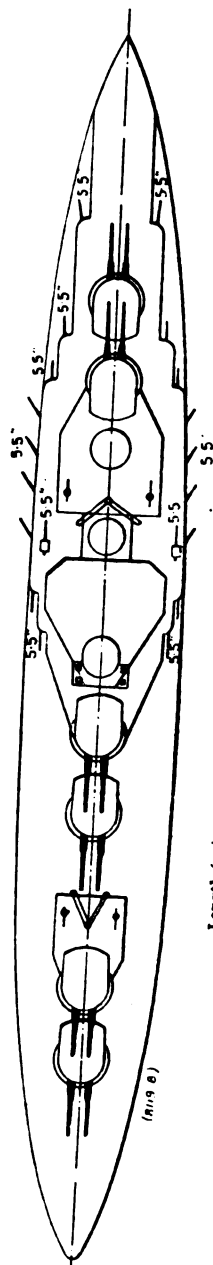
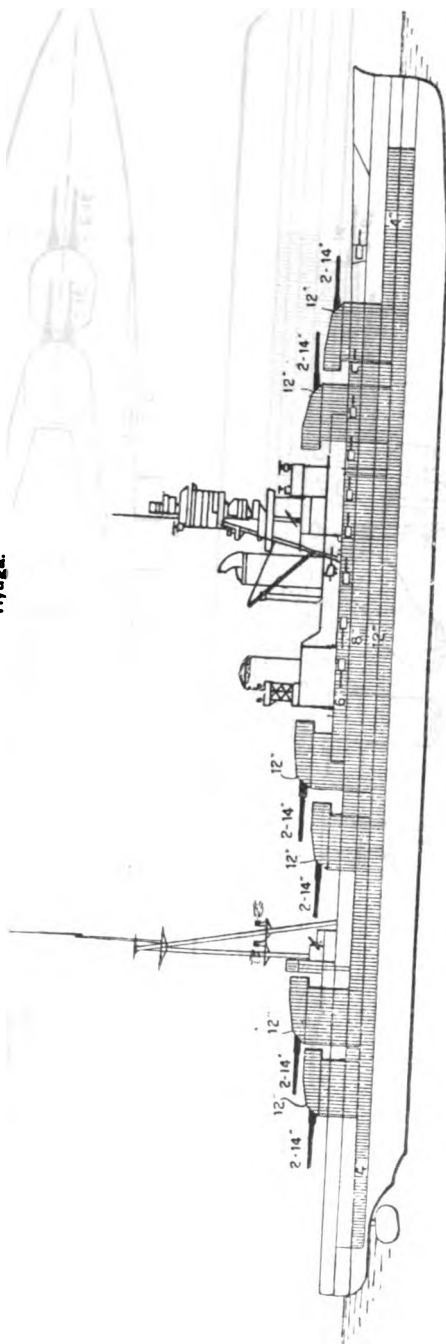
JAPAN.

BATTLESHIPS.

"Fuso" Class.

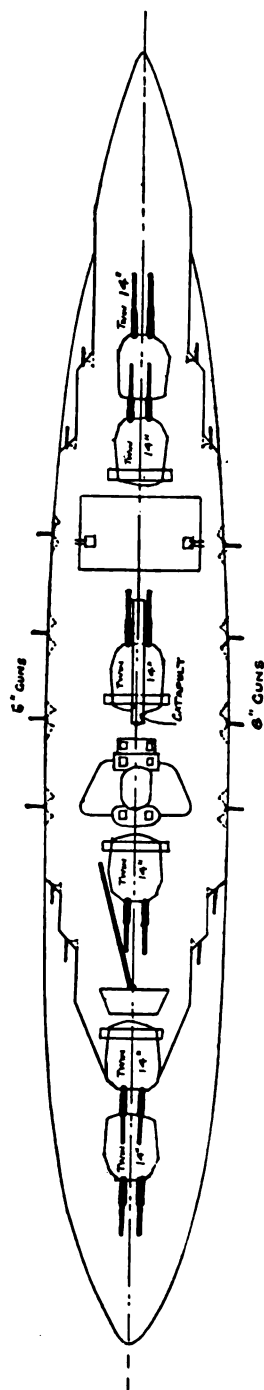
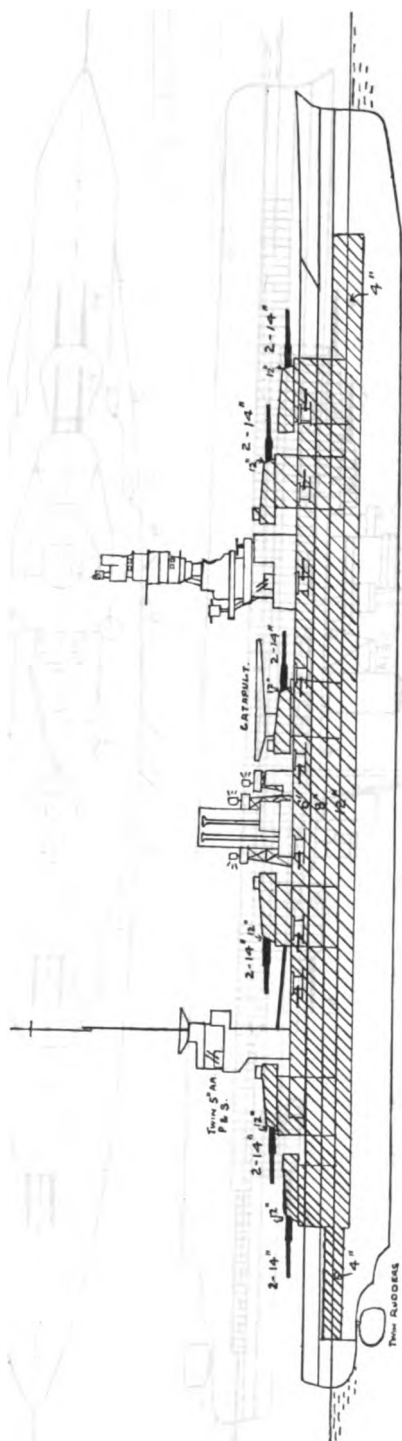
Ise.

Miyagi.



Length (extreme), 688 ft. ; Speed, 22 knots ; 29,900 tons ; Completed, 1917-18.
 Armament, 12—14-in. ; 18—5.5-in. ; 8—5.5-in. A.A. ; 8 m. ; 8 seaplanes ; 1 catapult.
 Correction to plan.—Fore topmast and foremost funnel removed. Superstructure built round mainmast. Main topgallant mast removed. Bridge work modified.

JAPAN.
BATTLESHIPS.
"Fuso" Class.
Fuso. Yamashiro.
 (After reconstruction, 1934.)



Length (extreme), 673 ft. ; Speed, 23½ knots ; 23,330 tons (standard) ; Completed, 1915. Reconstructed, 1933.
 Armament, 12—14-in. ; 16—6-in. ; 8—5.9-in. A.A. ; 4 M.G. ; 4 L. ; 1 catapult ; 3 seaplanes.

JAPAN.

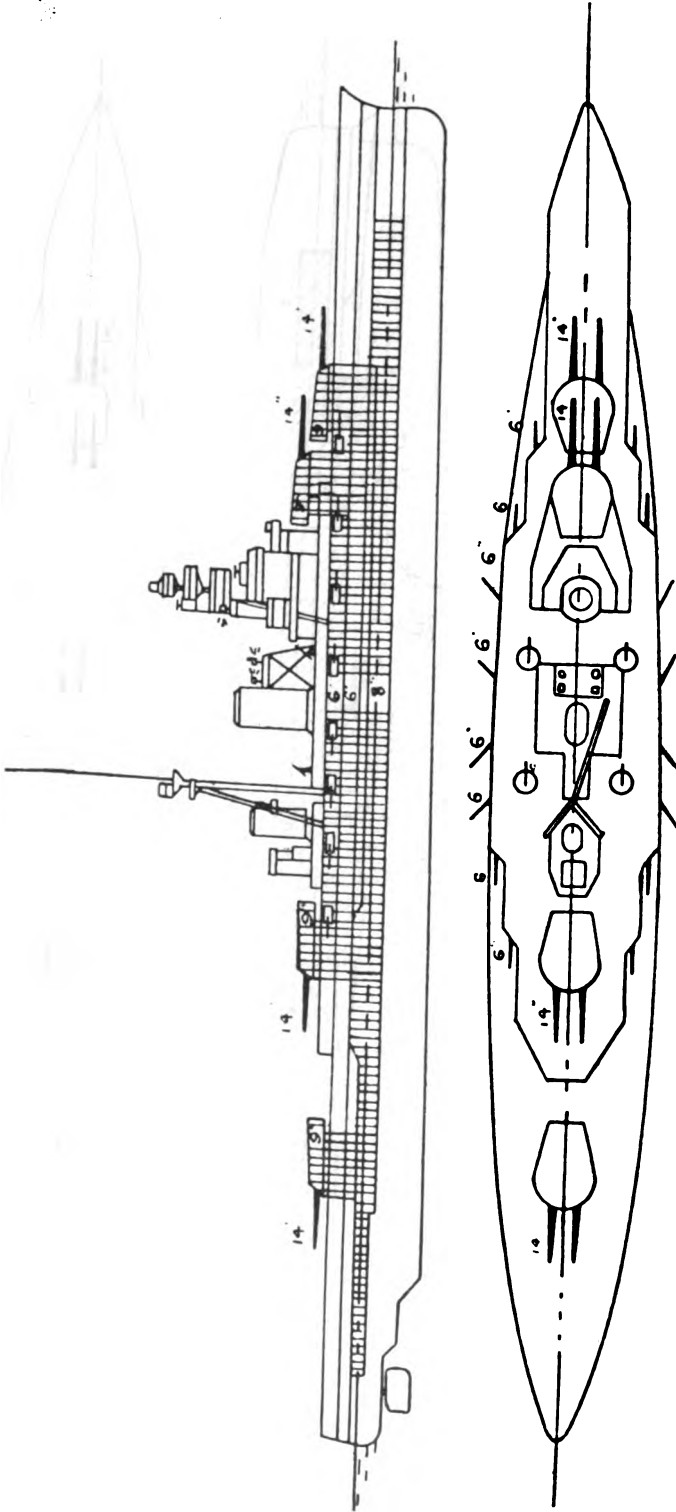
BATTLESHIPS.

"Kongo" Class.

Hiyeli.

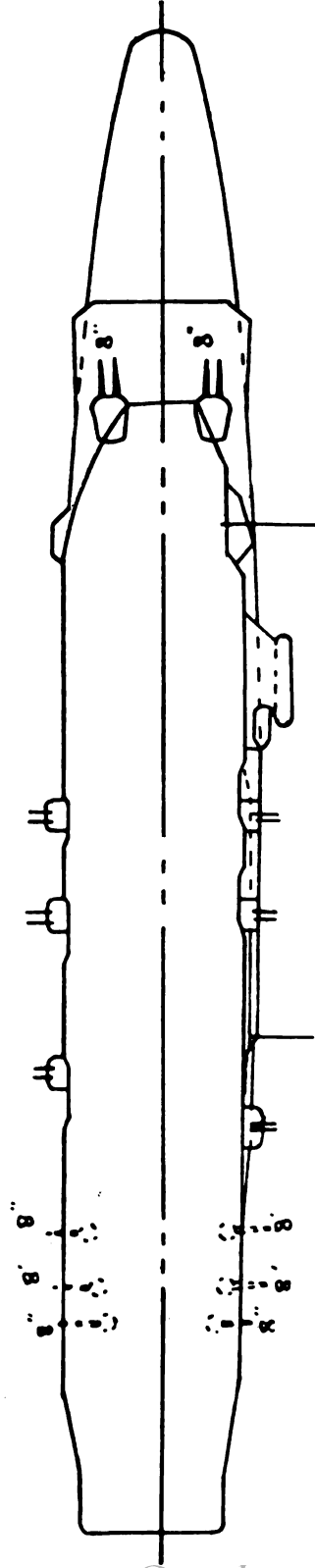
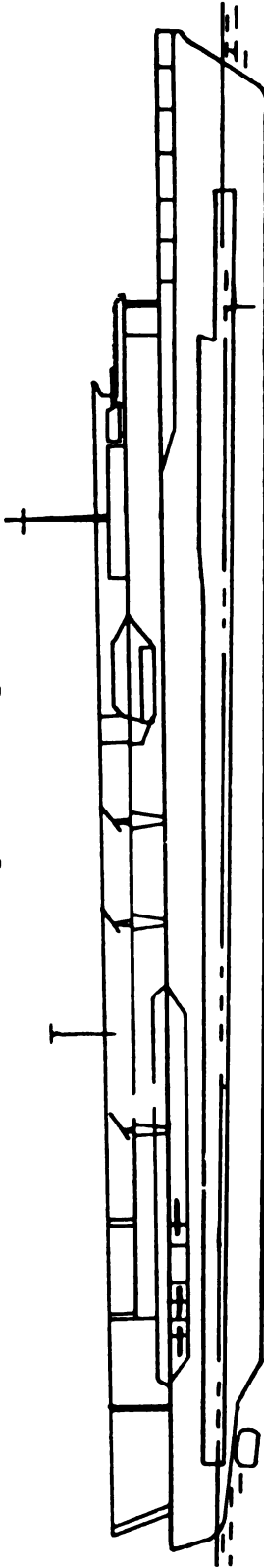
Kirishima.

Kongo.



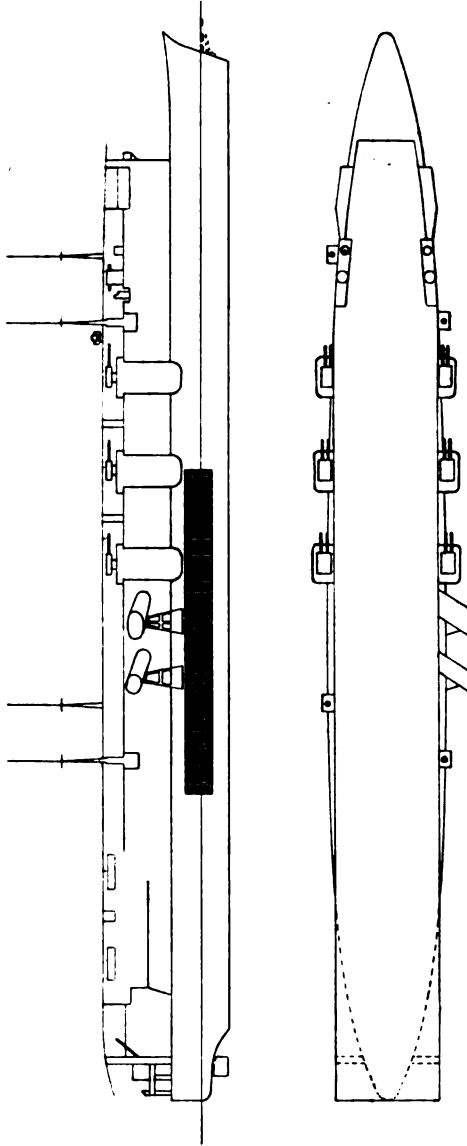
Length (extreme), 704 ft. ; Speed, 26 knots ; 20,880 tons ; Completed, 1914-15. Reconstructed, 1924-25.
 Armament, 8-14-in. ; 16-6-in. ; 8-6-in. A.A. ; 4 M. 18 submerged 21-in. torpedo tubes ; 8 aircraft ; 1 catapult.
 Hiyeli of this class has been converted to a Training Ship in accordance with the London Naval Treaty.
 Corrections to plan.—The A.A. guns are in twin mountings. Derrick fitted between after turrets. Kongo has funnels of equal height

JAPAN.
AIRCRAFT CARRIERS.
Akagi. Kaga.



Length (between perpendiculars), 763 ft. ; 20,900 tons ; Speed, 28·5 knots ; Completed, 1927.
Armament, 10—4-in. ; 12—4·7-in. A.A. Accommodation for 80 planes.
Corrections to plan.—Superstructure aided and flight deck extended to bows.

JAPAN.
AIRCRAFT CARRIER.
Ryujo.

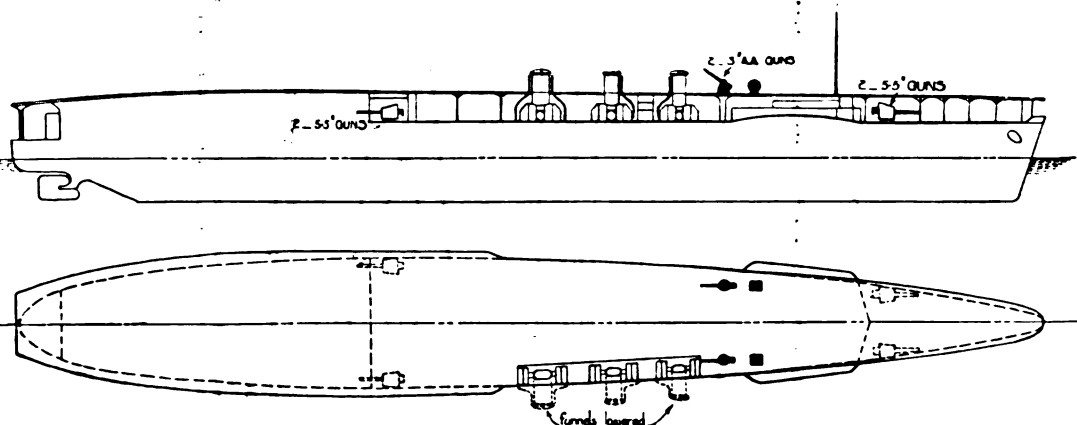


Length (on W.L.) 548 ft.; 7,100 tons; Speed, 26 knots; Completed, 1933.
Armament, 12—6.1-in. A.A. Accommodation for 24 planes.

JAPAN.

AIRCRAFT CARRIER.

Hosho.

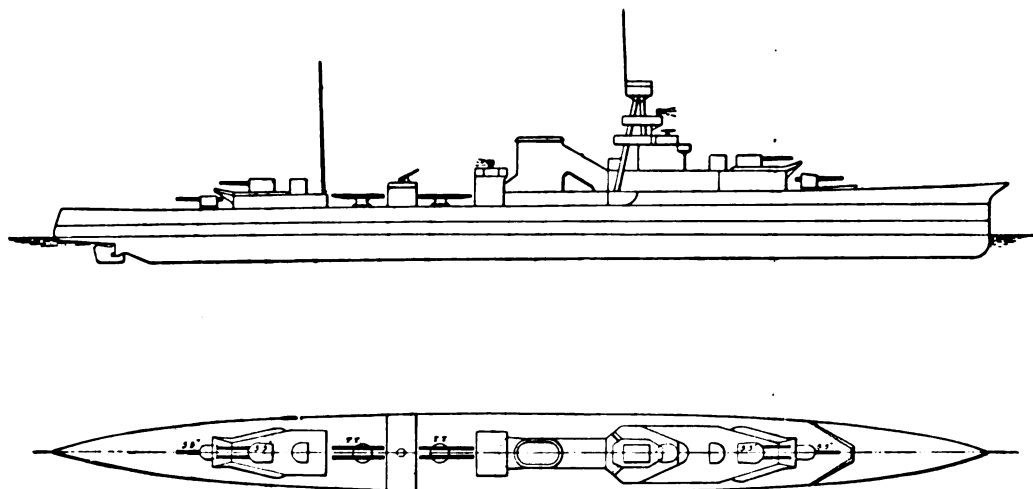


Displacement, 7,470 tons; Length B.P., 510 ft.; Speed, 25 knots; Completed, 1922.
 Armament, 4—5.5-in.; 2—3-in. A.A.; Carries about 20 planes; Fitted with gyro-stabiliser.
 Funnels hinge outboard.

JAPAN.

LIGHT CRUISER.

Yubari.

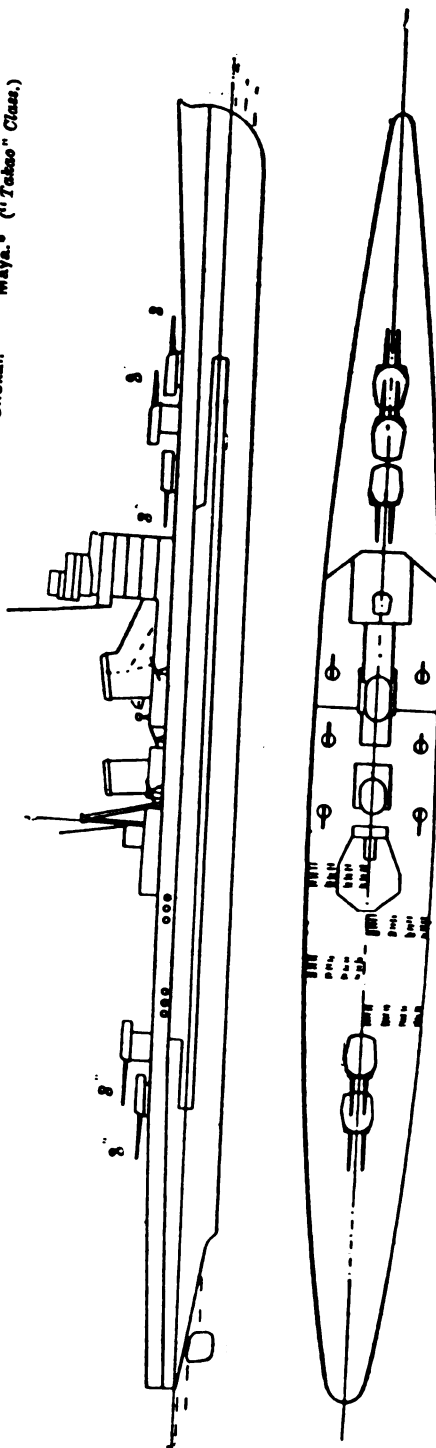


Length (extreme), 465 ft.; 2,890 tons; Speed, 33 knots. Completed, 1923.
 Armament, 6—5.5-in.; 1—3 in. A.A.; 2 M.; 2 twin 21-in. torpedo tubes; 34 mines.
 Correction to plan.—Masts and funnel raked aft.

JAPAN.

CRUISERS.

'Nachi	Myoko.	Ashigara.	Haguro. ("Nachi" Class.)	Atago.*	Takao.*	Chokai.*	Maya.* ("Takao" Class.)
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Length (extreme), 660 ft. ("Takao" Class); 640 ft. ("Nachi" Class); "Nachi" Class, 10,000 tons; "Takao" Class, 9,800 tons; Speed, 33 knots.

Armament, 10—8-in.; 8—4.7-in. A.A., 2 M.; 12—21-in. torpedo tubes; 2 catapults; 4 aircraft.

* These have 4—4.7-in. A.A., and 8—21-in. torpedo tubes.

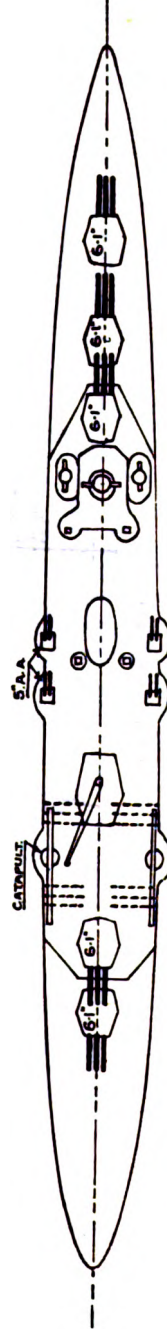
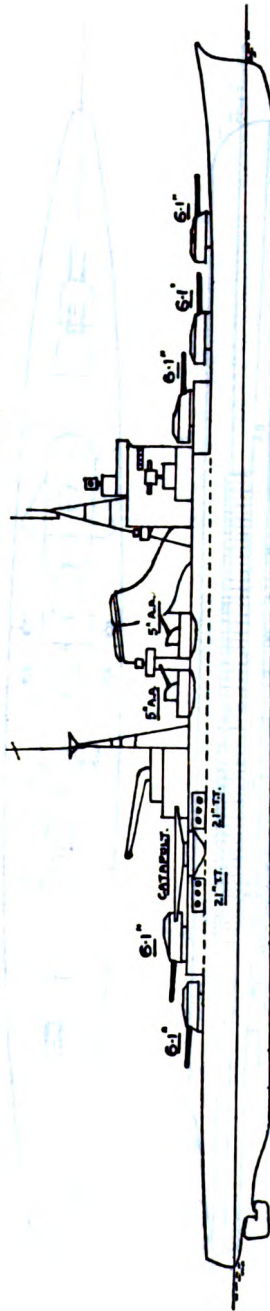
Corrections to plan.—In the "Takao" Class the after funnel is vertical, and the torpedo tubes are beneath the funnels on a deck higher. The four 4.7-in. A.A. guns are also a deck higher. Foremast has four braced legs. In the "Nachi" Class the foremost pair of 4.7-in. A.A. guns are a deck higher. Catapults fitted abaft mainmast,

JAPAN.

CRUISERS.

'Mogami' Class.

Mogami.	Mikuma.	Suzuya.	Kumano.	Tone.	Tikuma.
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Length (extreme), 640 ft. ; 8,500 tons ; Speed, 33 knots.

Armament, 15—6.1 in. ; 8—5-in. A.A. ; 12—21-in. torpedo tubes ; 2 catapults, 4 aircraft.

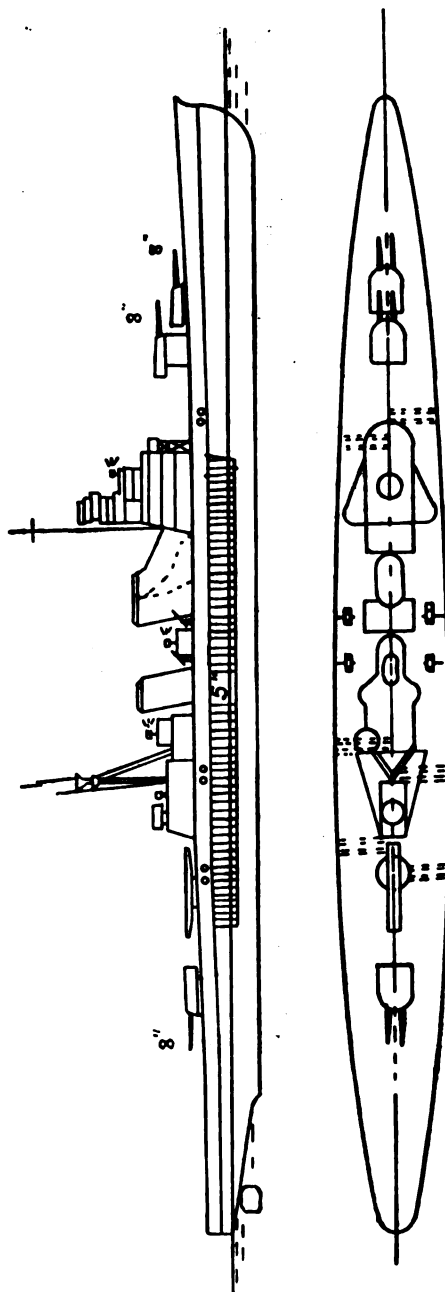
Mogami and Mikuma completed, 1935 ; Suzuya, 1936 ; Kumano, 1937 ; Tone, 1938 ; Tikuma, 1939.

JAPAN.

CRUISERS.

"Furutaka" Class.

Aoba. Kinugasa.



Length (extreme), 595 ft. ; 7,100 tons ; Speed, 33 knots ; Completed, 1927.
 Armament, 6-8-in. ; 4-4-7-in. A.A. ; 10 M. ; 12-21-in. torpedo tubes ;
 1 catapult ; 2 aircraft.

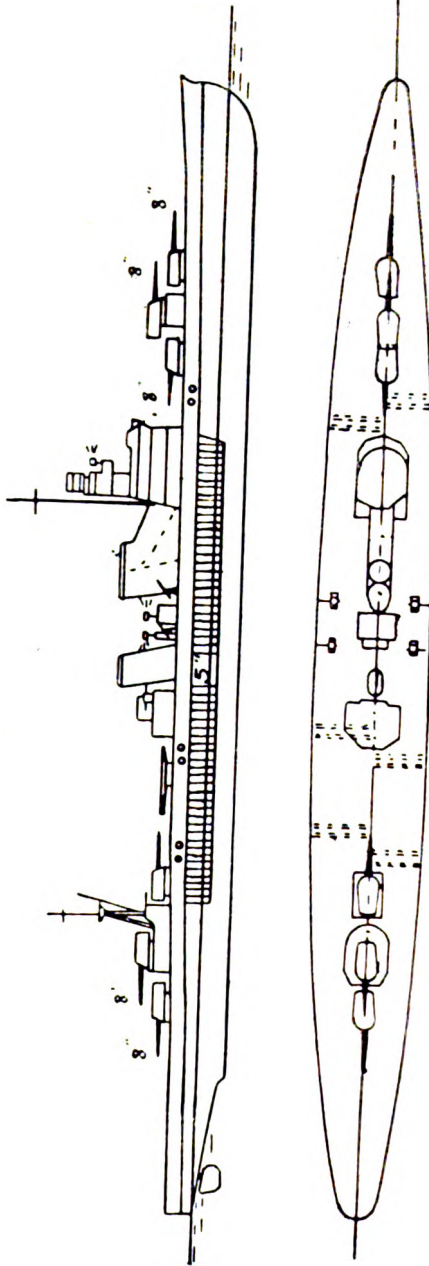
Correction to plan.—The tops of the funnels are square to the funnels.
 The pole mast is raked.

JAPAN.

CRUISERS,

"Furutaka" Class.

Furutaka. Kako.



Length (extreme), 595 ft.; 7,100 tons; Speed, 33 knots.
Armament, 6—8-in.; 4—4.7-in. A.A.; 10 M.; 12 above-water 21-in. torpedo tubes;

1 catapult; 2 aircraft.

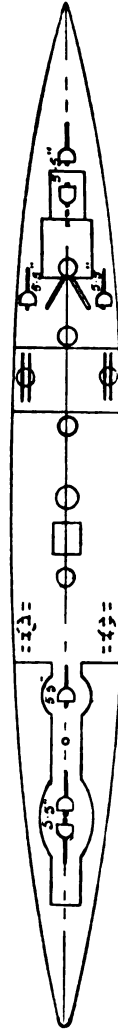
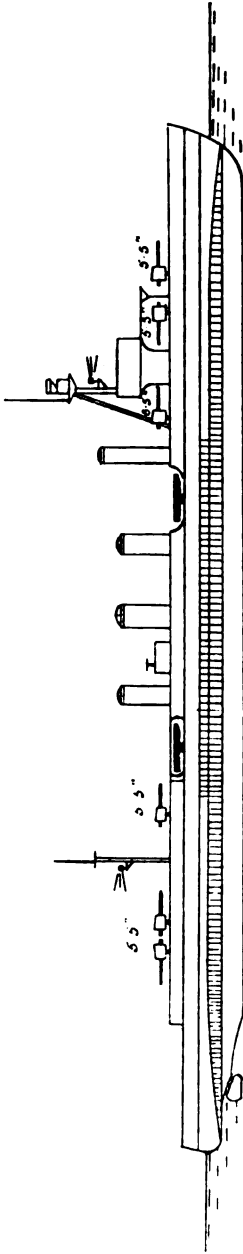
Correction to plan.—The tops of the funnels are square to the funnels.
The masts are raked.

JAPAN.

LIGHT CRUISERS.

"Sendai" Class.

Naka. Sendai. Jintau.



Length (extreme), 585 ft. ; Speed, 33 knots ; 5,196 tons ; Completed, 1924-25.

Armament, 7-6.6-in. ; 2-8-in. A.A. ; 6 m. ; 4 twin 21-in. torpedo tubes ; 80 mines ; 1 seaplane ; 1 catapult.

Correction to plan.—Bows of Jintau and Naka have been modified to give more flair. Catapult fitted abaft mainmast which is of tripod construction and is fitted with a derrick. Aircraft platform removed from forecastle.

JAPAN.

LIGHT CRUISERS.

"Natori" Class,

{ Isudzu.
Nagara.{ Natori.
Yura.{ Kinu.
Abukuma.

"Kuma" Class.

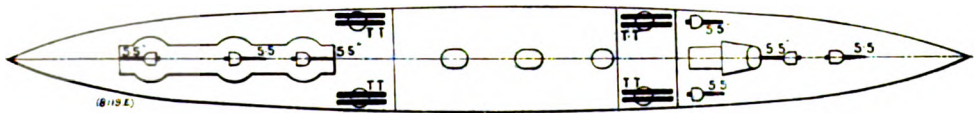
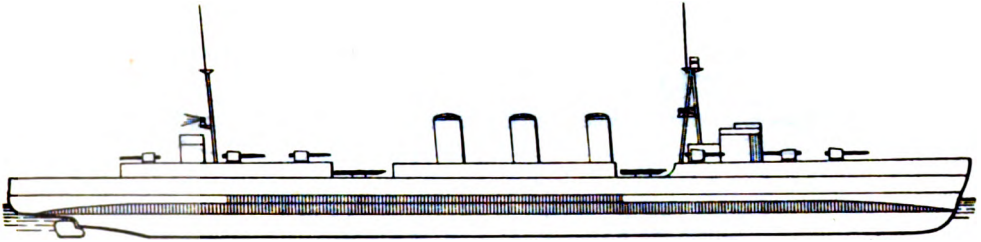
Oi.

Kiso.

Kitakami.

Tama.

Kuma.



Length (extreme), 535 ft. ; Speed, 33 knots ; "Kuma" Class, 5,100 tons ; "Natori" Class, 5,170 tons ;
Completed, 1920-23.

Armament, 7—5.5-in. ; 2—3-in. A.A. ; 2 M. ; 4 twin above-water 21-in. torpedo tubes ; 1 catapult ; 1 aircraft. 80 mines
Corrections to plan.—Catapult fitted before mainmast, which is of tripod construction and is fitted with a derrick.

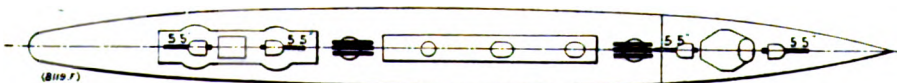
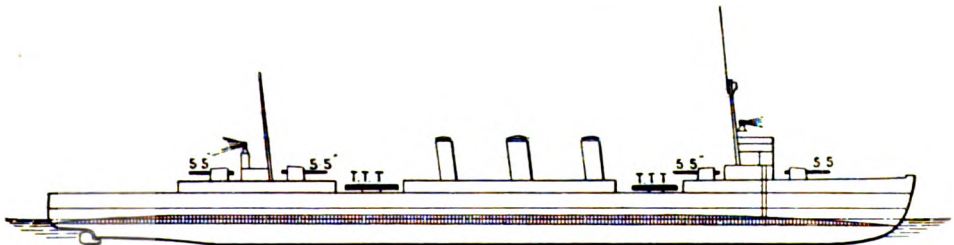
Bridgework modified and anti-flare tops fitted to funnels.

LIGHT CRUISERS.

"Tenryu" Class.

Tatsuta.

Tenryu.

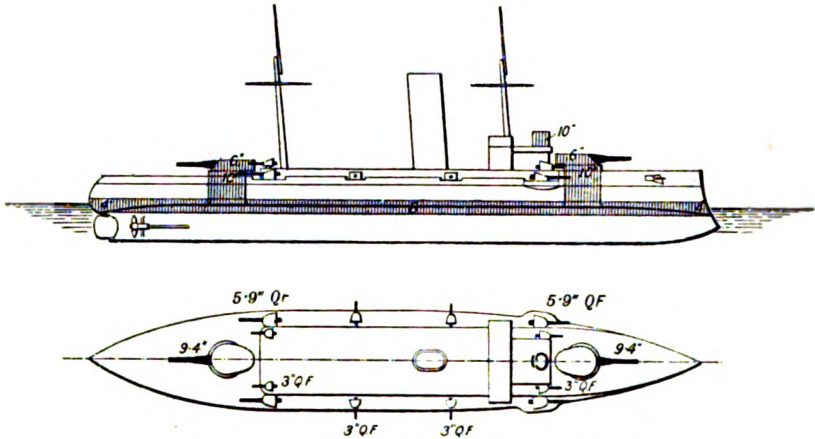


Length (extreme), 468 ft. ; Speed, 31 knots ; 3,230 tons ; Completed, 1919.
Armament, 4—5.5-in. ; 1—3-in. A.A. ; 2 M. ; 2 triple above-water torpedo tubes ; 1 seaplane.
Fitted for Minelaying.

NETHERLANDS.

COAST DEFENCE SHIP

Hertog Hendrik.

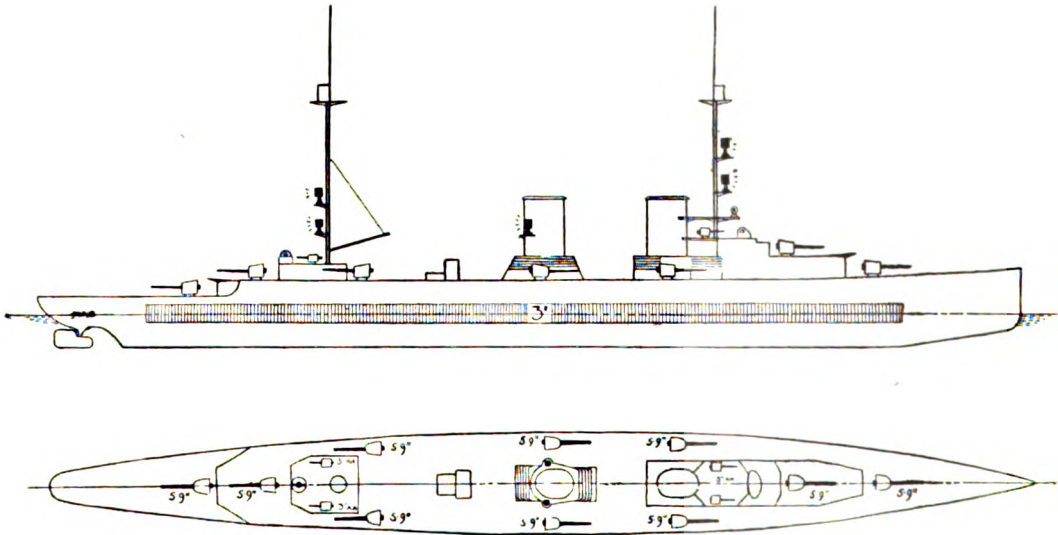


Length, 317 ft.; 4,371 tons; Speed, 16 knots; Completed, 1904.
 Armament, 1—9.4-in. ; 4—5.9-in. ; 2—3-in. ; 6—1 pr. ; 2 M.
 After gun removed.

NETHERLANDS.

CRUISERS.

Java. Sumatra.



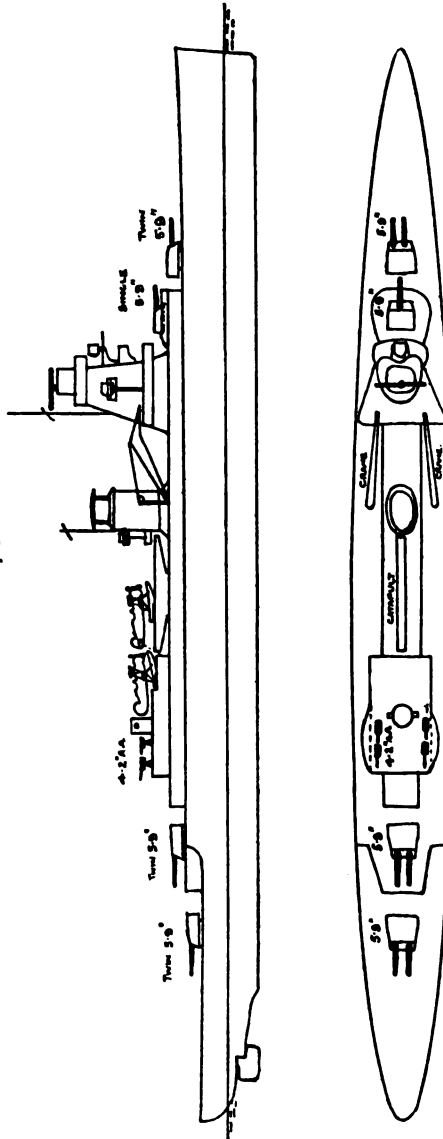
Length, 509½ ft. ; 6,670 tons; Speed, 31 knots; Completed, 1925-26.
 Armament, 10—5.9 in. ; 6—1.5 in. ; 6—5-in. A.A. ; 8 M. ;
 40 mines; 2 seaplanes.

Corrections to plan —These cruisers have been reconditioned. The 4—3-in.A.A. have been removed. The mainmast has been shortened, moved forward, and fitted with derrick and searchlights. Main topmast removed. 3—4-cm. machine guns have been fitted each side of the after deck house. The forward 4-sided 5.9-in. have been raised a deck to the signal deck, which has been extended aft for the purpose. Fore topmast shortened and foremast made larger. Cranes fitted abreast foremost funnel. Aircraft stowed between funnels.

NETHERLANDS.

CRUISER.

De Ruyter.



Length (extreme) 560 ft.; 6,450 tons; Speed, 32 knots.

Armament, 7—6.9-in.; 10—1.9-in. A.A.; 8—5-in. A.A.; 8 M.G.; 1 catapult; 2 seaplanes

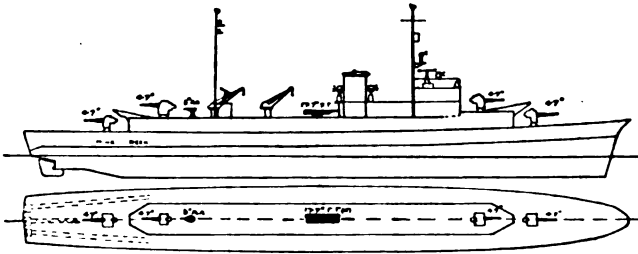
Completed, 1936.

Correction to plan.—Funnel top modified.

NORWAY.

MINELAYER AND TRAINING SHIP.

Olav Trygvason.



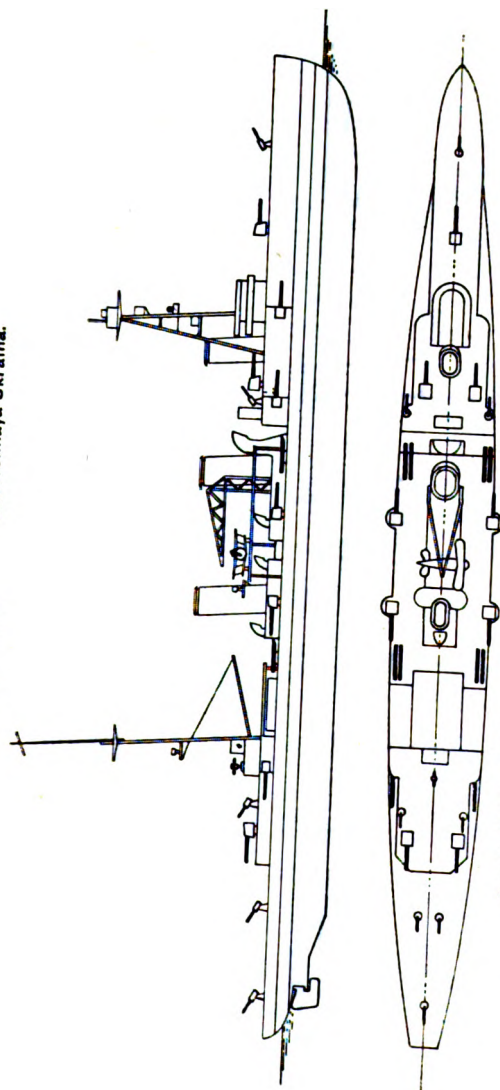
Length, 319½ ft.; 1,747 tons; speed, 21½ knots; Completed, 1934.

Armament, 4—4-7-in.; 1—3-in. A.A.; 2—17-7-in. torpedo tubes,
280 mines.

Correction to plan.—Both cranes are fitted abreast the mainmast.

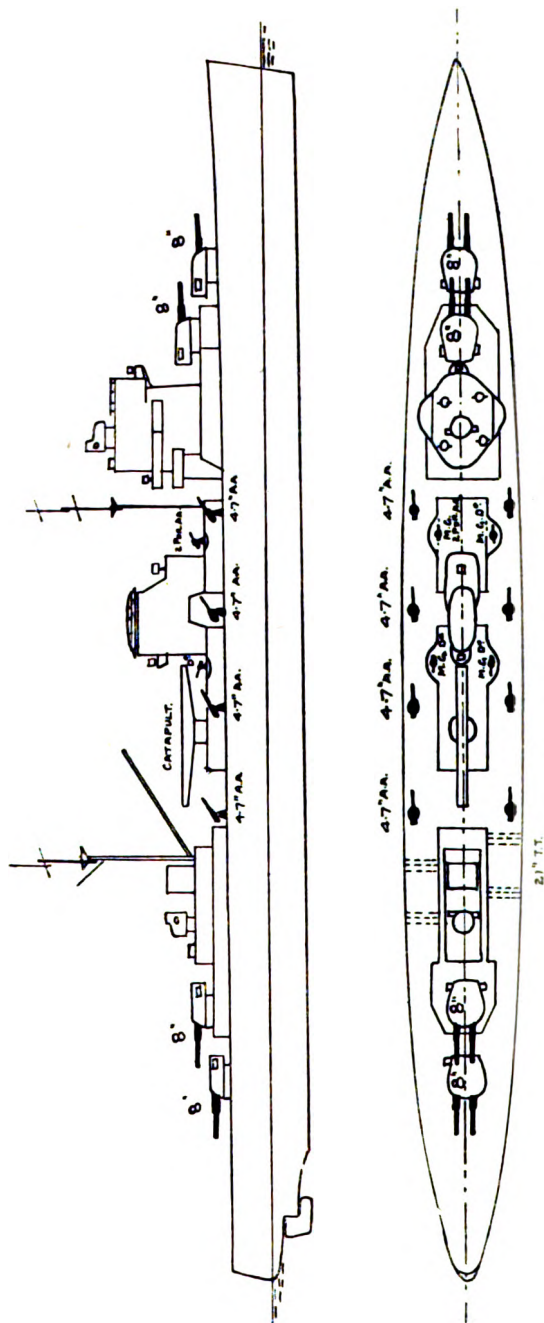
SOVIET UNION.
CRUISERS.

Profintern.
Chervonnaya Ukraina.



Length, 520 ft.; Displacement, 7,200 tons; Speed, 29½ knots; Completed, 1924-25.
Armament, 16-5.1-in.; 4-4-in.; 4-3-in. A.A.; 4 M.; 12-21-in. torpedo tubes; 100 mines; 2 seaplanes.

SPAIN.
CRUISER.
Canarias.



Length (extreme), 636 ft. ; 10,000 tons ; 33 knots ; Completed, 1935.

Armament, 8-8-in. ; 8-4.7-in. A.A. ; 12-21-in. torpedo tubes ; 1 catapult ; 2 aircraft.
Masts removed.

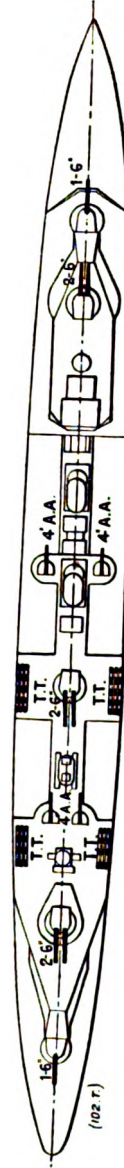
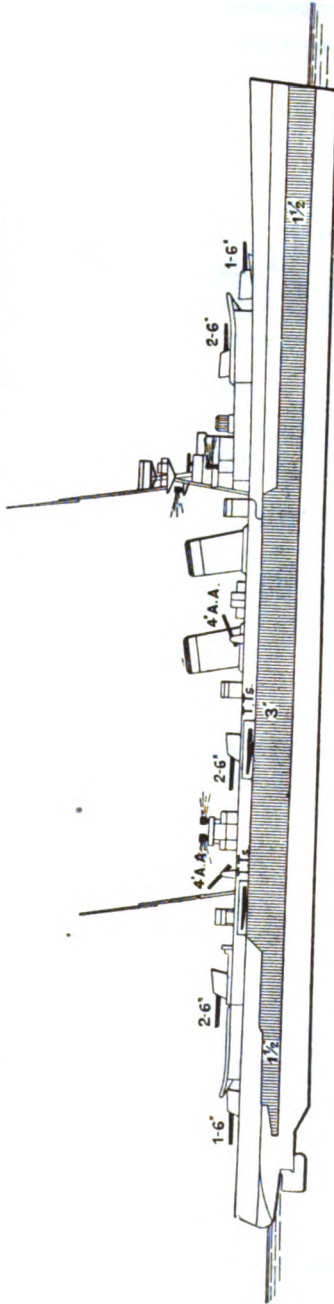
SPAIN.

CRUISERS.

Galicia (ex Libertad (ex-Principe Alfonso).)

Almirante Cervera.

Miguel de Cervantes.



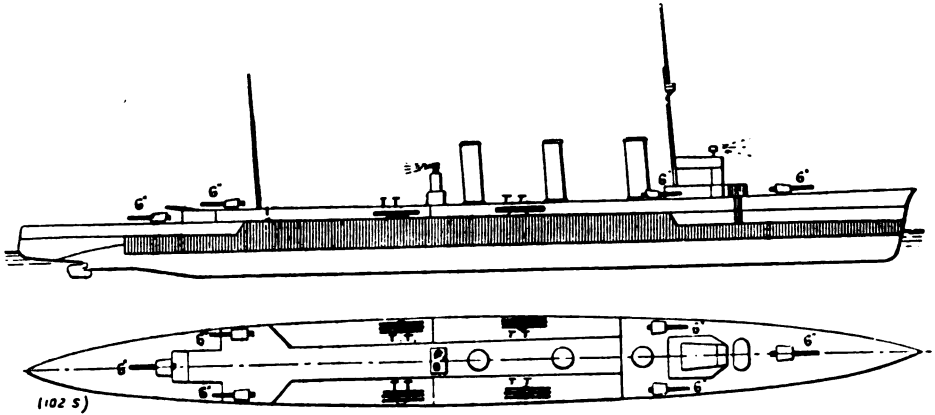
Length (extreme), 579 ft. 6 ins. ; 7,475 tons ; Speed, 33 knots. Completed 1927-1930.
 Armament, 8-6-in. ; 4-4-in. A.A. ; 2-3 pr. ; 1 M. ; 4 triple above-water torpedo tubes (21-in. torpedoes).

Corrections to plan.—The mainmast is tripod. Fore topmast and topgallant mast removed.

SPAIN.

LIGHT CRUISER.

Mendez Nuñez.



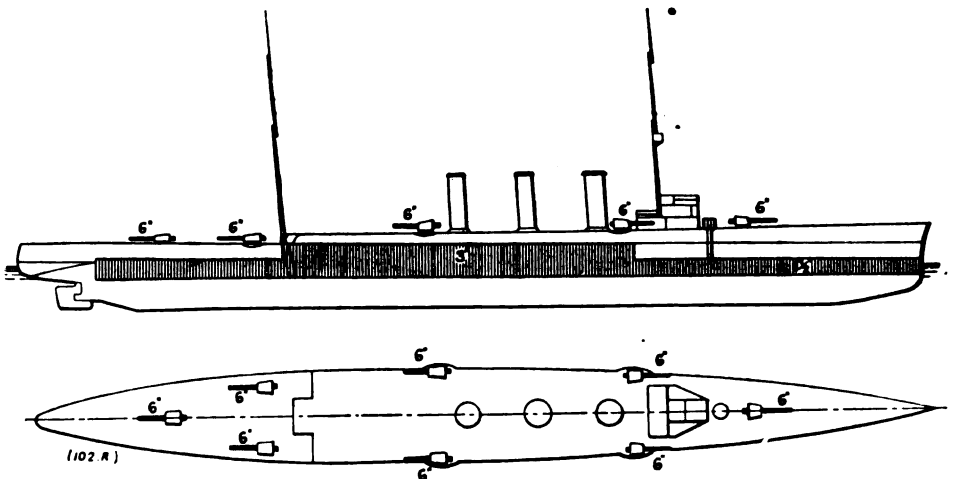
Length (extreme), 462 ft. ; 4,500 tons ; Speed, 29 knots. Completed, 1924.
Armament, 6—6-in. ; 4—1·9-in. A.A. ; 4 M. ; 4 above-water triple torpedo tubes (21-in. torpedoes).

NOTE.—The armour belt is 3 ins. thick, tapering to 1½ ins. at the ends.

Corrections to plan.—The foremast is tripod. Fore topgallant mast is fitted.
A.A. Armament is fitted between second funnel and mainmast. Searchlight platform added round after funnel.

LIGHT CRUISER.

Navarra (ex-Republica, ex-Reina Victoria Eugenia).



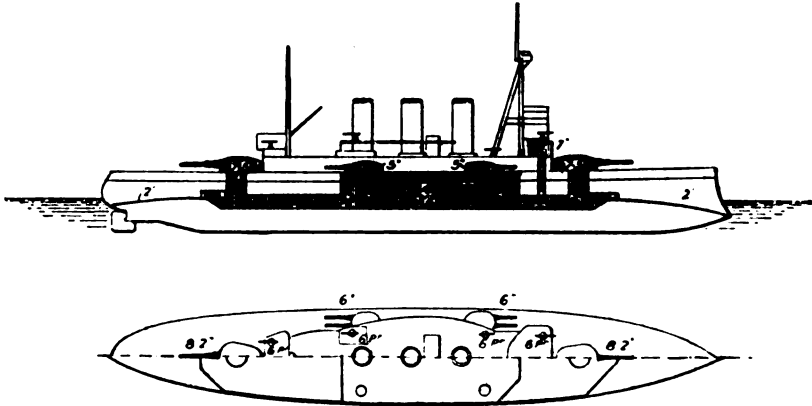
Length (extreme), 462 ft. ; 4,857 tons ; Speed, 25½ knots ; Completed, 1923.
Armament, 6—6-in. ; 4—3·5-in. A.A. ; 4 M. ; 1 L. ; 4—21-in. torpedo tubes.

Correction to plan.—Foremost funnel and masts removed. Tower built in place of foremast and superstructure built in place of mainmast and fitted with pole masts. A.A. Armament fitted in way of funnels. Upper deck extends further aft.

SWEDEN.

BATTLESHIP.

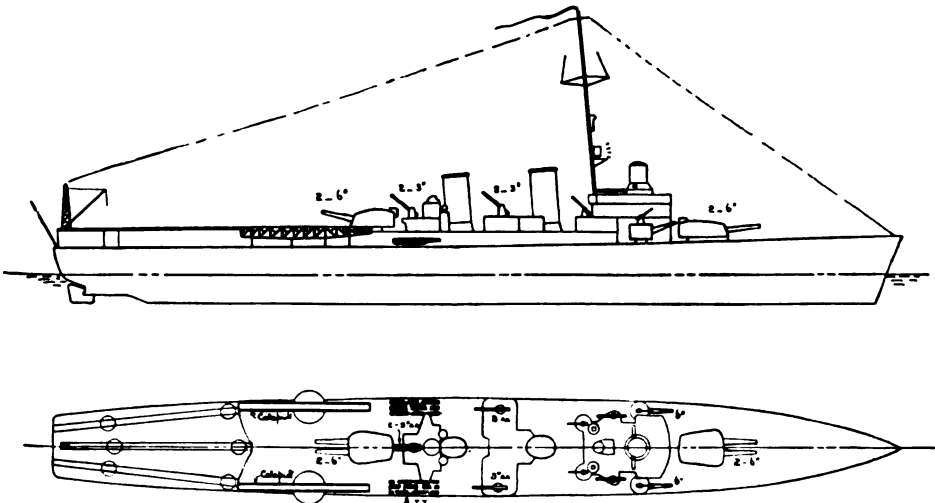
Oscar II.



Length, 318-6 ft. ; 4,250 tons ; Speed, 18 knots ; Completed, 1907.
 Armament, 2—8-3-in. ; 8—5-9-in. ; 8—6-pr. ; 1—1-pr. ; 2 submerged 18-in. torpedo tubes.
 Searchlights fitted on foremast and mainmast.

AIRCRAFT CRUISER.

Gotland.

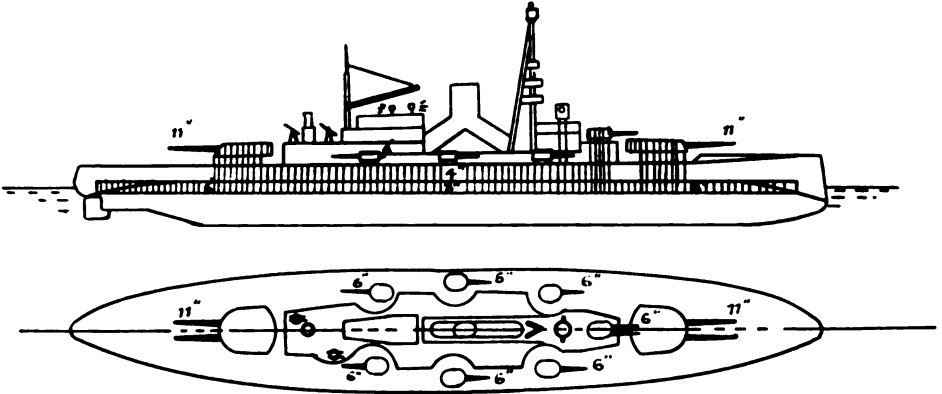


Length, 442 ft. ; 4,700 tons ; Speed, 27 knots ; Completed, 1934.
 Armament, 6—6-in. ; 4—3-in. A.A. ; 4 M. ; 6—21-in. torpedo tubes ; 1 catapult ; 8 seaplanes ; 100 mines
 Correction to plan.—1 catapult is fitted on middle line.

SWEDEN.

COAST DEFENCE SHIPS.

Gustav V. Sverige.
(As reconstructed 1924-29.)



Length, 396.7 ft. ; Sverige, 6,899 tons ; Gustav V, 7,100 tons ; Speed, 23 knots ; Completed, 1917-21.

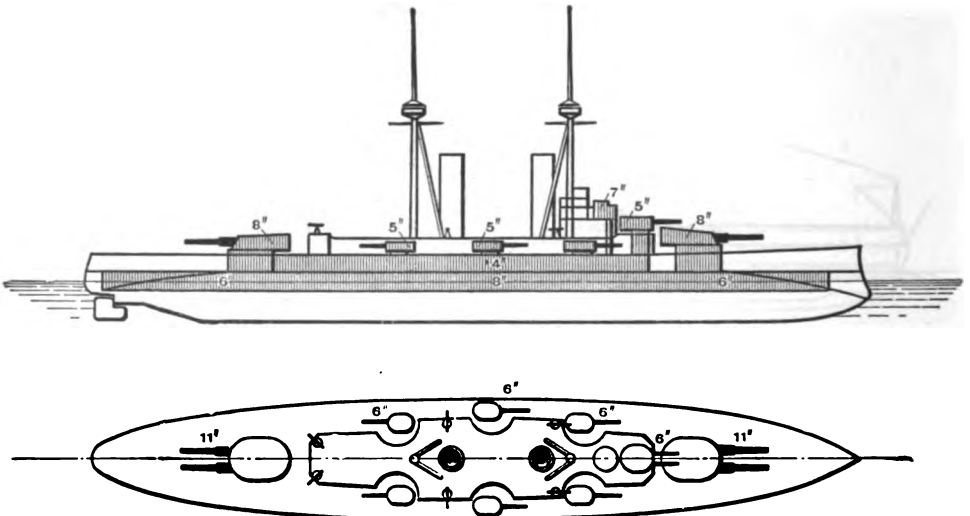
Armament, 4—11-in. ; 8—5.9-in. ; 4—3-in. ; 2—6-pr. ; 6 M.

Correction to plan.—Fore topmast added. Bridgework extended. Mainmast removed. In Sverige the mainmast is shortened ; two funnels are fitted, the after one being vertical and the forward one bent.

SWEDEN.

COAST DEFENCE SHIP.

Drottning Victoria.



Length, 396.7 ft. ; 7,160 tons ; Speed, 23 knots ; Completed, 1921.

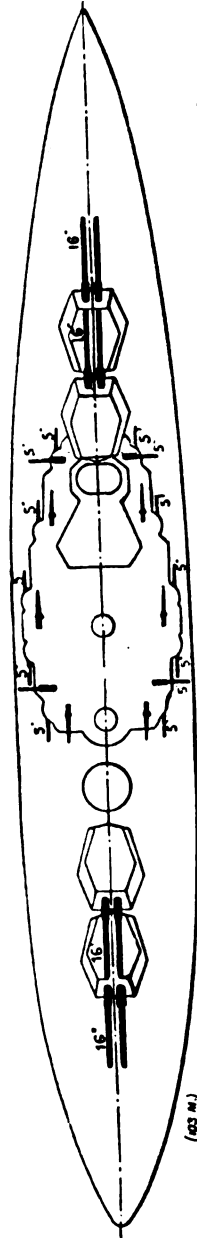
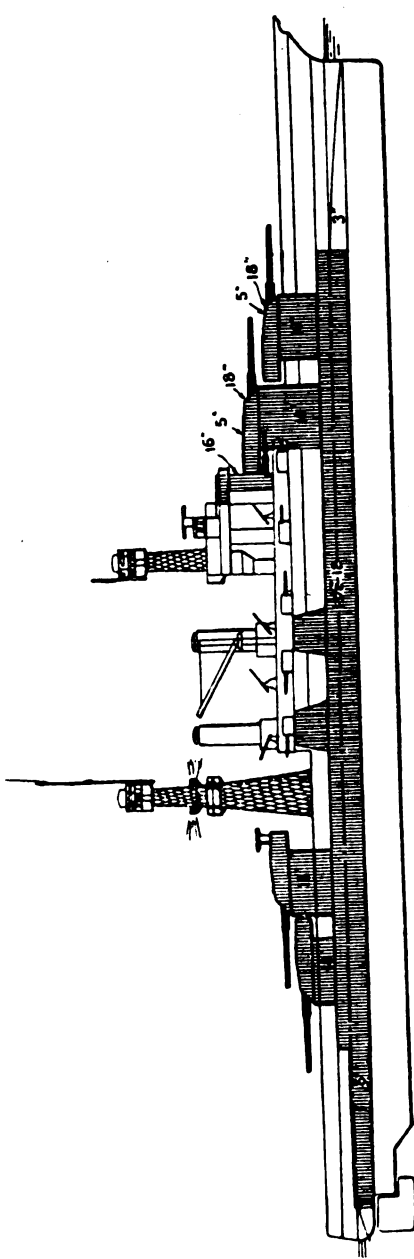
Armament, 4—11-in. ; 8—5.9-in. ; 4—3-in. ; 2—6-pr. ; 9 M.

Mainmast removed and bridgework modified. Searchlight platform and A.A. guns fitted abaft after funnel.

UNITED STATES.

BATTLESHIPS.

Colorado. Maryland. West Virginia.



(33 M.)

Length (extreme), 624 ft. ; Length W.L., 600 ft. ; Speed, 21 knots ; 31,500-32,500 tons ; Maryland, completed, 1921 ; Colorado and West Virginia, completed, 1923.

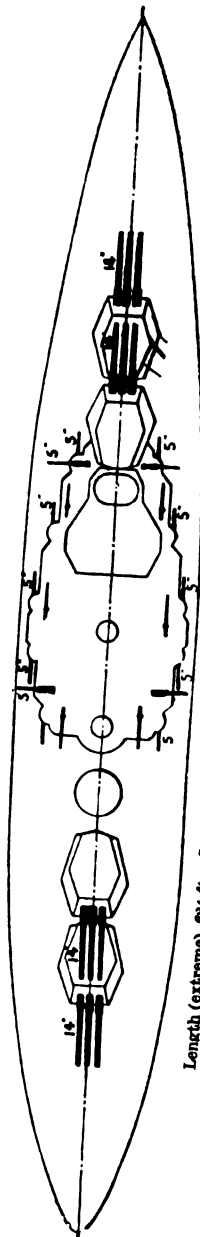
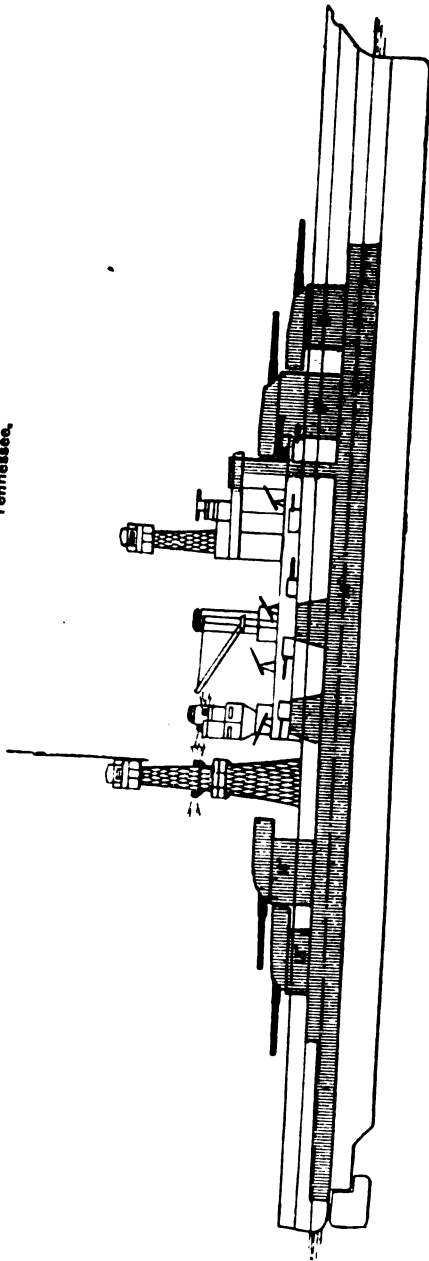
Armament, 8-16-in. ; 12-6-in. A.A. ; 2-6-pr. ; 2-1-pr. ; 8 M. ; 2 submerged 21-in. torpedo tubes ; 2 catapults ; 3 aircraft. Corrections to plan.—Catapults fitted on "X" turret and quarter deck. Crane fitted at stern. Main topgallant mast removed. Range finder fitted on B turret of Maryland.

UNITED STATES.

BATTLESHIPS.

California.

Tennessee.



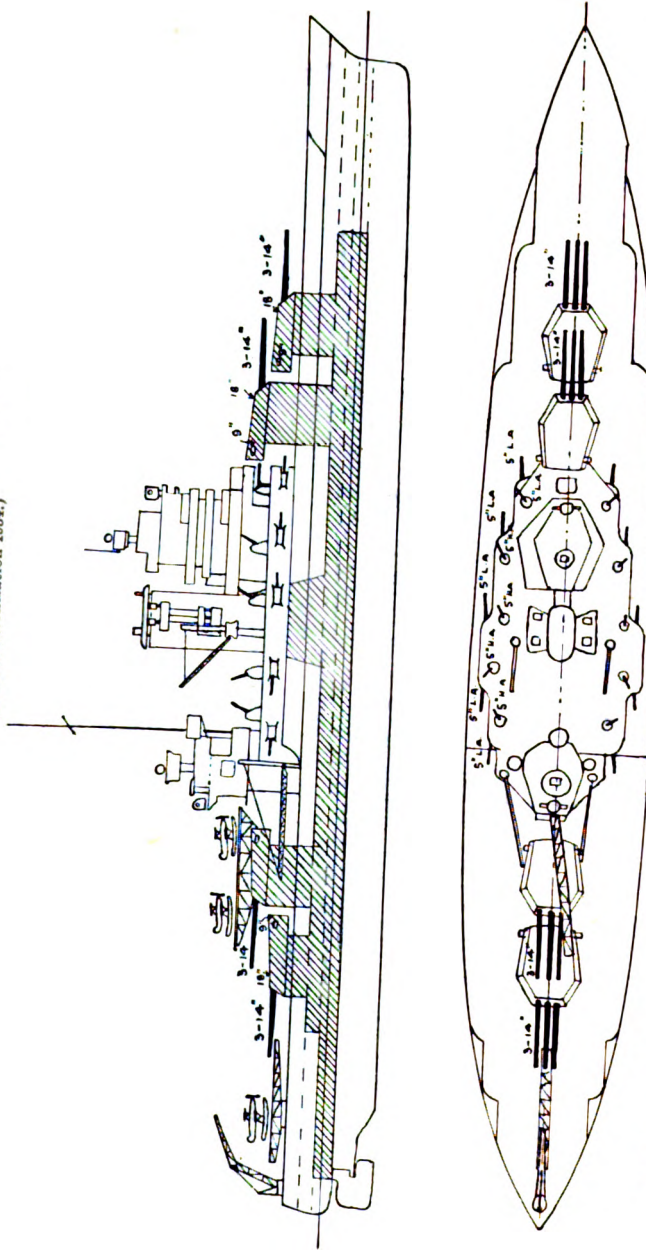
Length (extreme), 624 ft. ; Length W. L., 600 ft. ; Speed, 21 knots ; 32,600-32,800 tons ; Completed, 1920-21.
 Armament, 12-14-in. ; 12-6-in. ; 8-6-in. A. A. ; 2-6-pr. ; 2-1-pr. ; 8 M. ; 2 submerged 21-in. torpedo tubes.
 2 catapults (one right aft on quarter deck and one "X" turret) ; 3 seaplanes.
 Main topmast shortened. Crane at stern.
 Topmast and yards fitted to foremast.

UNITED STATES.
BATTLESHIPS.

Idaho.

New Mexico.
(After modernisation 1934.)

Mississippi.



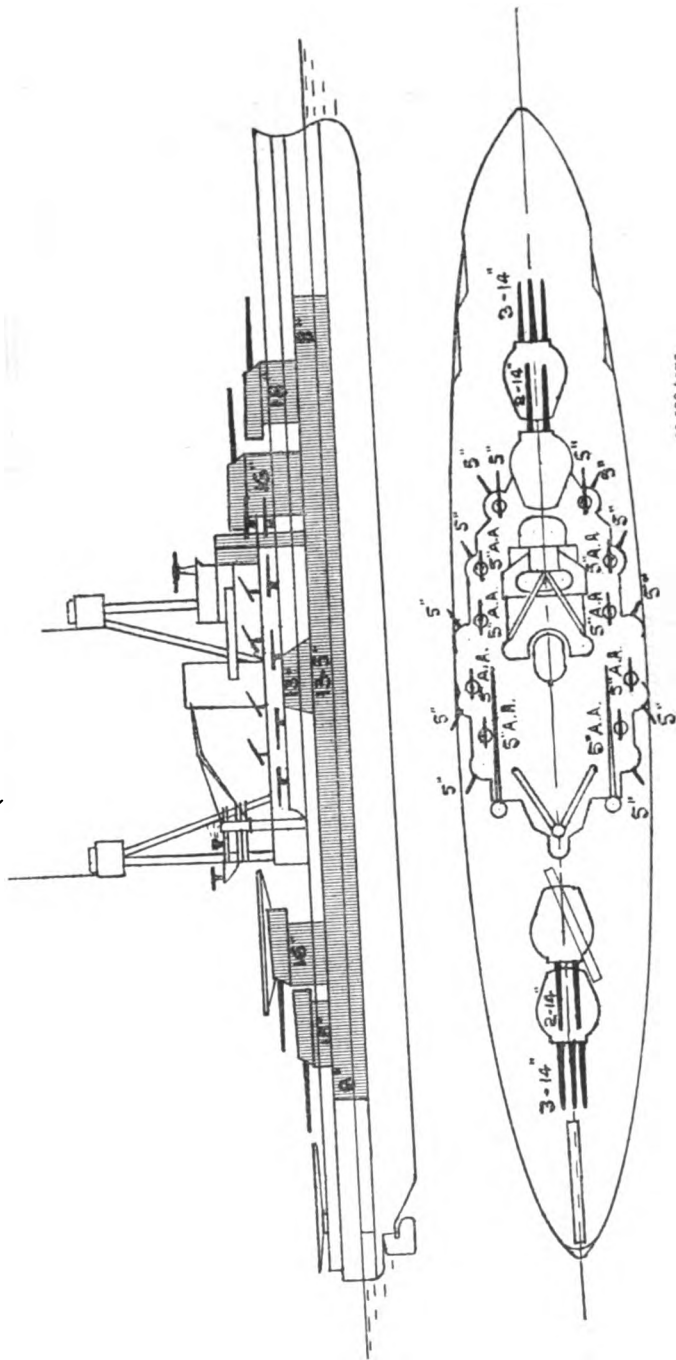
Length (extreme), 624 ft.; Length, W.L., 600 ft.; Speed, 22½ knots; 33,000 tons; Idaho and New Mexico, 33,400 tons; Completed, 1917-19; Modernised, 1931-4. Armament, 12-14-in.; 12-5-in.; 8-5-in. A.A.; 2-6-pr. (Idaho, 2-3-pr.); 2-1-pr.; 8 m.; 2 catapults; 3 seaplanes.

UNITED STATES.

BATTLESHIPS.

Nevada. Oklahoma.

(As reconstructed 1929.)



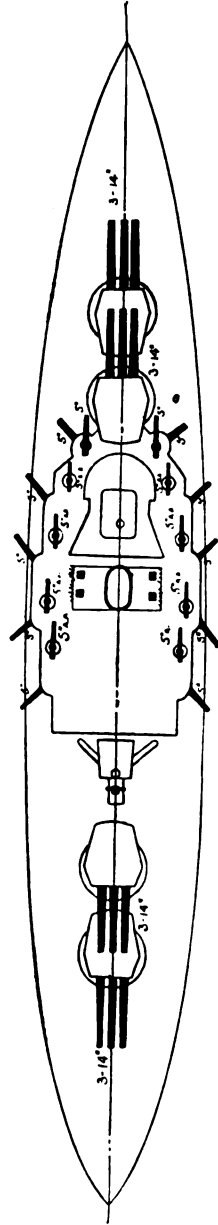
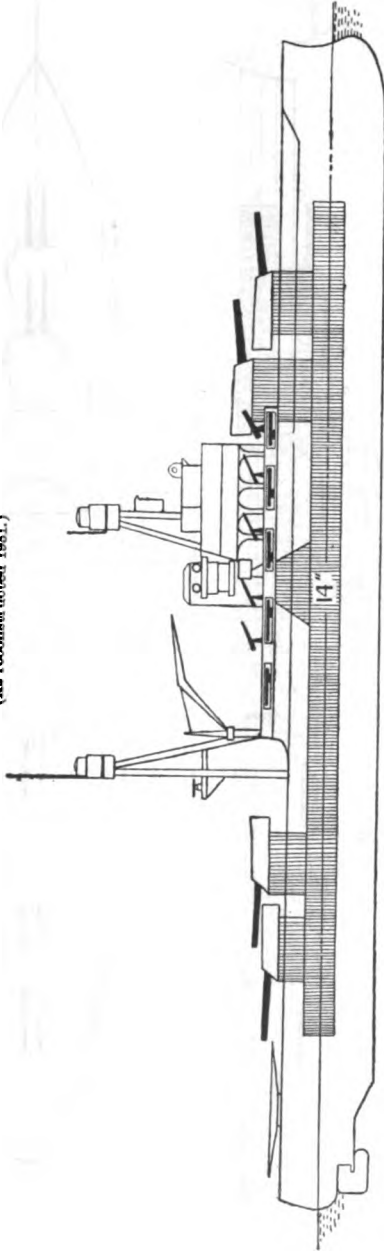
Length (extreme), 583 ft. ; Length W.L., 575 ft. ; Speed, 20.5 knots ; 22,000 tons.
 Armament, 10—14-in. ; 12—6-in. A.A. ; 2—6-pr. (Oklahoma, 2—3-pr.) ; 2—1-pr. ; 2 M. ; 2 L. ; 2 catapults ; 3 aeroplanes.
 Correction to plan.—Bridgework extended and mastsheads modified.

UNITED STATES.

BATTLESHIP.

Pennsylvania.

(As reconstructed 1931.)



Length (extreme), 608 ft.; Length R.P., 508 ft.; Speed, 21 knots; 33,100 tons; Completed, 1916.
 Armament, 13—14-in.; 12—6-in.; 8—4-in. A.A.; 2—3-pr.; 3 m.; 2 p.; 2 catapults; 8 aircraft.

Corrections to plan.—Catapults fitted on "X" turret and quarter deck. Crane fitted at stern. Main topmast is on fore side of mast structure.

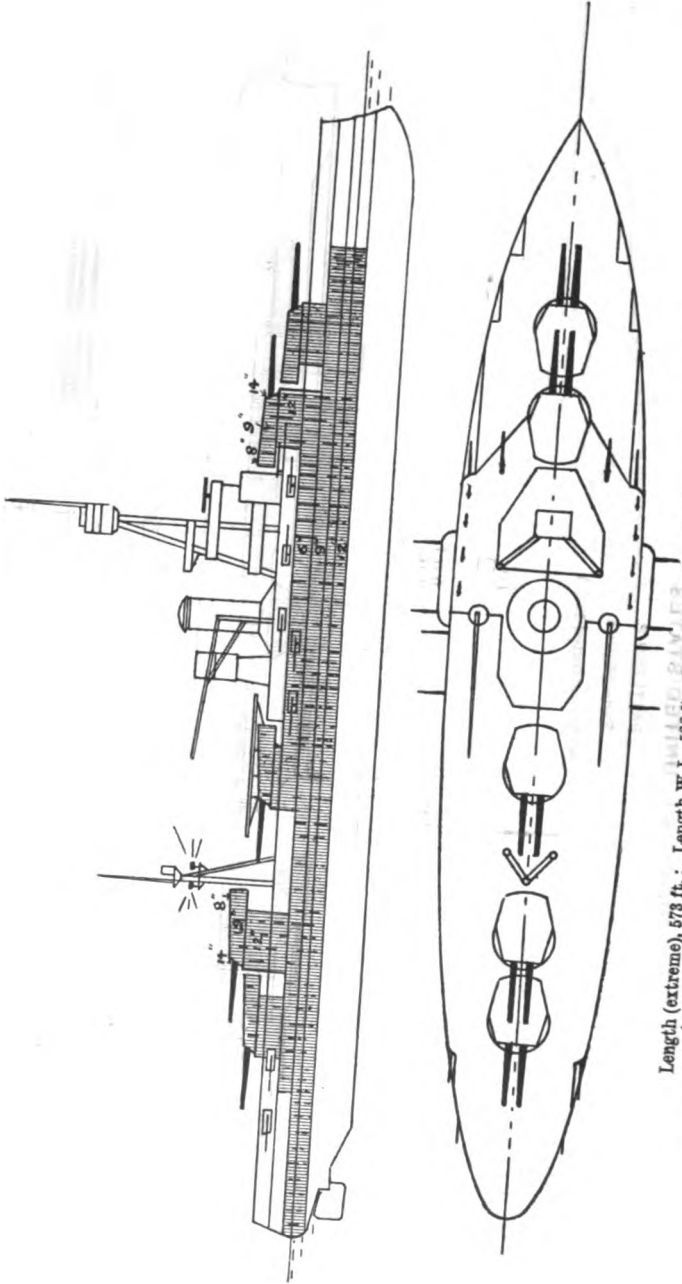
UNITED STATES.

BATTLESHIPS.

New York.

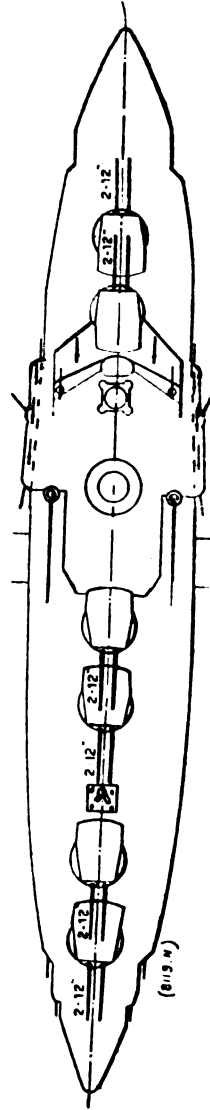
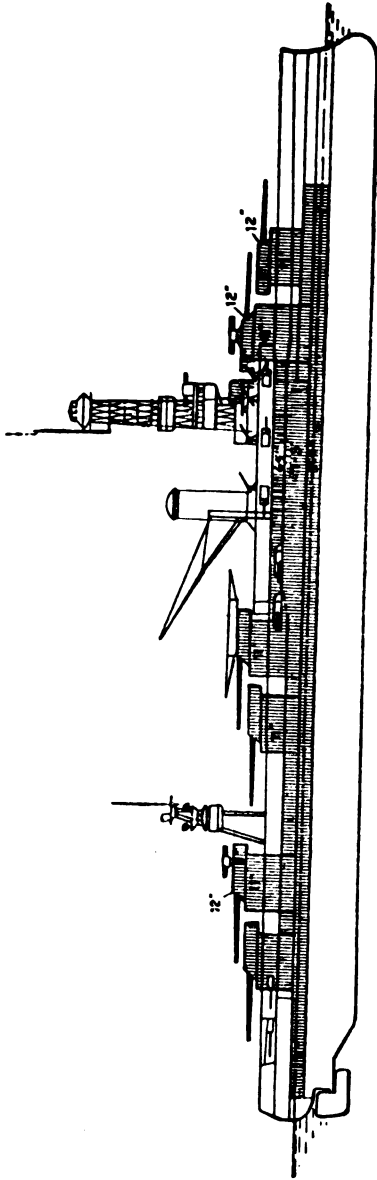
Texas.

(As reconstructed 1927.)



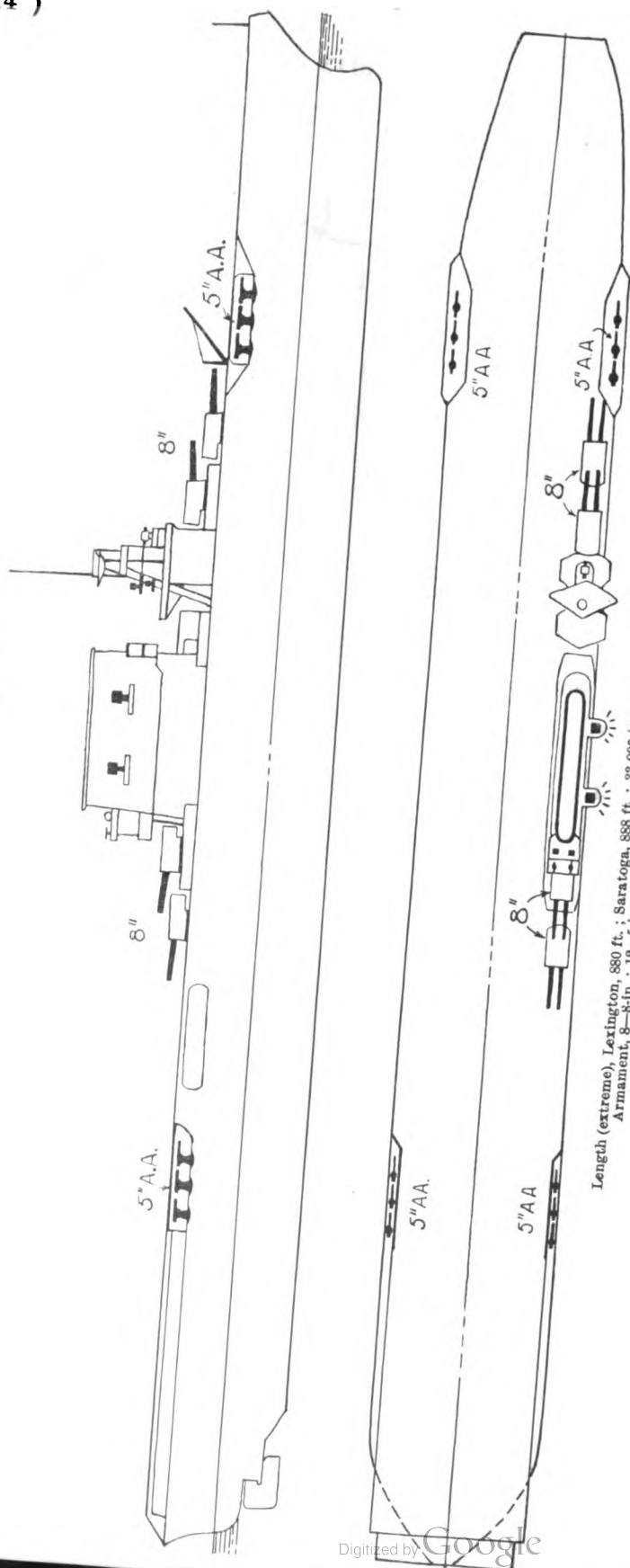
Length (extreme), 573 ft. ; Length W. L., 566 ft. ; Speed, 21 knots ; 27,000 tons ; Completed, 1914.
 Armament, 10-14-in. ; 16-5-in. ; 8-3-in. A.A. ; 2-3-pr. ; 8 M. ; 1 catapult ; 3 aircraft.
 Corrections to plan.—Fore topmast removed, mast heads modified. Main mast head fitted with machine guns.
 Range finders fitted on "B" and "X" turrets.

UNITED STATES
BATTLESHIP.
Arkansas.
(As reconstructed 1927.)



Length (extreme), 662 ft. ; Length, W. L., 555 ft. ; Speed, 20.5 knots ; 26,100 tons ; Completed, 1912.
Armament, 12—12-in. ; 16—6-in. A. A. ; 2—8-pr. ; 8 M. ; 1 catapult ; 8 aircraft.
Wyoming, a sister ship, has been demilitarized and converted to a training ship.

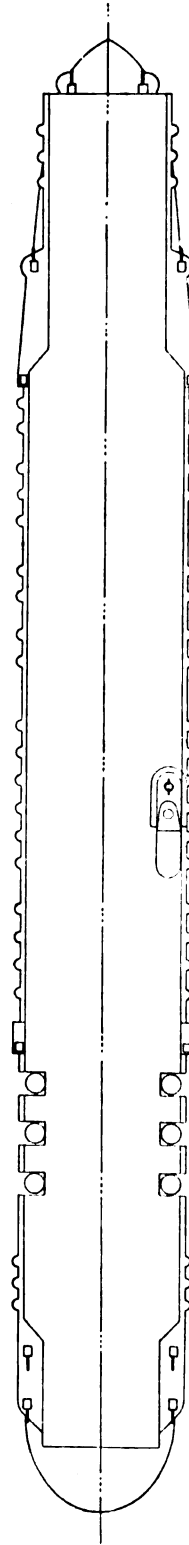
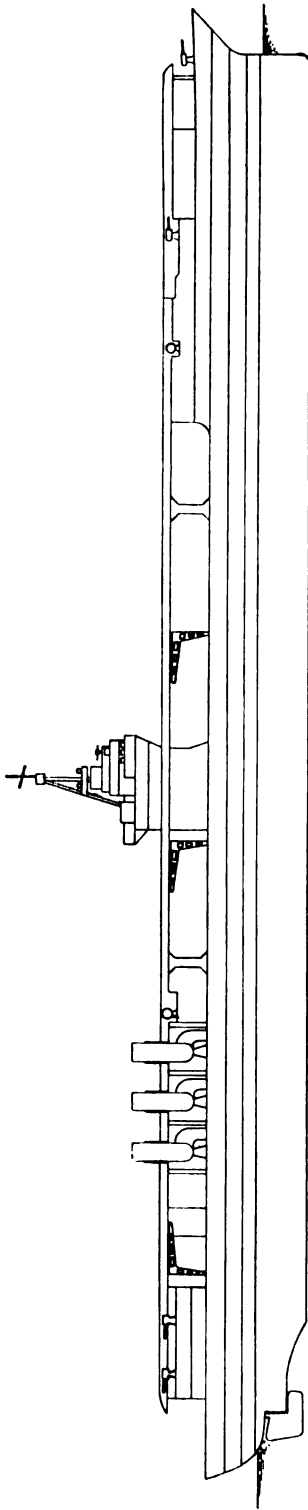
UNITED STATES.
AIRCRAFT CARRIERS.
Lexington. Saratoga.



Length (extreme), Lexington, 880 ft. ; Saratoga, 889 ft. ; Armament, 8—8-in. ; 12—6-in. A.A. ; 2—6-pr. ; Speed, 33-9 knots ; Completed, 1927.
Correction to plan.—Lexington has platform round top of funnel.

UNITED STATES.
AIRCRAFT CARRIER.

Ranger.

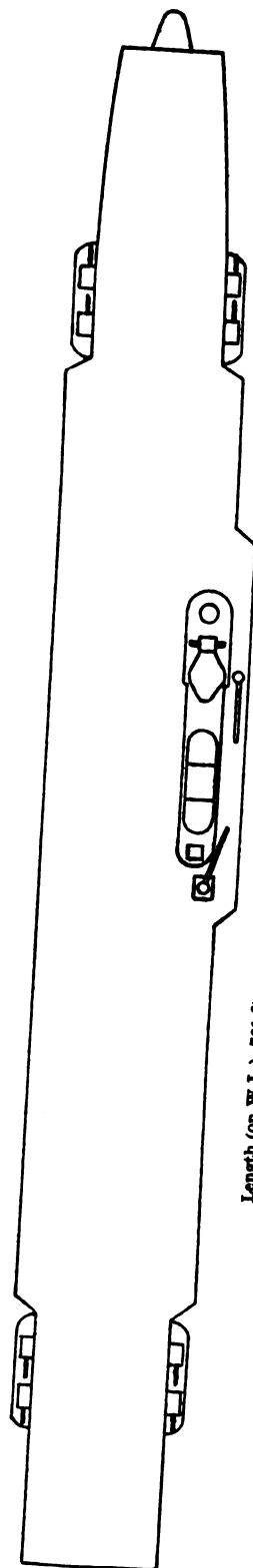
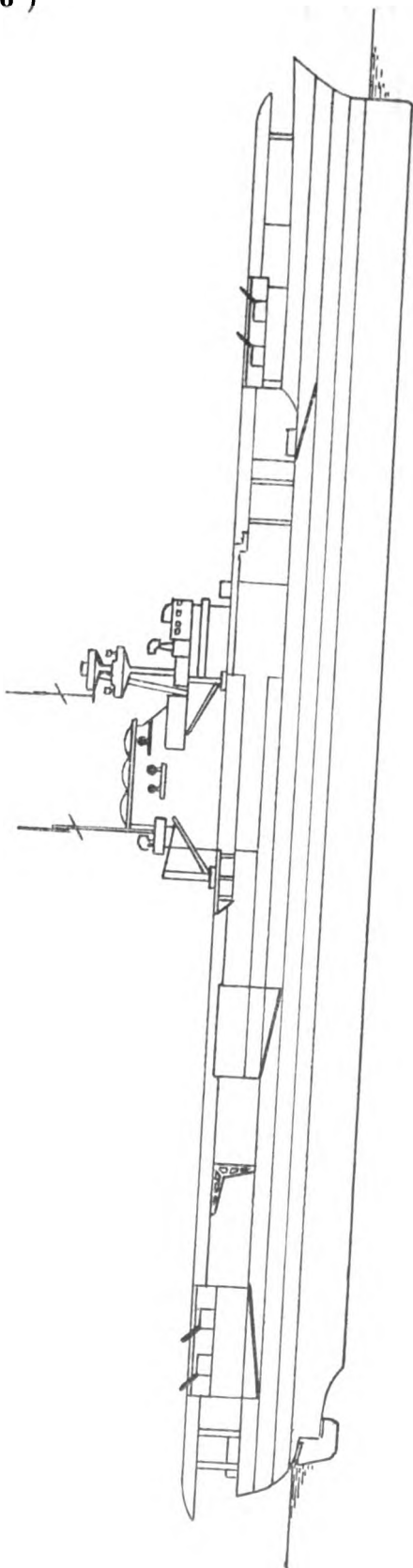


Length (overall), 769 ft. ; Length W.L., 728 ft. ; Displacement, 14,500 tons ; Speed, 29½ knots. Completed, 1934.
Armament, 8—5-in. A.A. ; 50 M.G. ; 76 aircraft.

NOTE.—The funnels can be swung outboard. Signal masts fitted at ends of flight deck.

UNITED STATES.
AIRCRAFT CARRIERS.

Enterprise. Yorktown. Hornet.

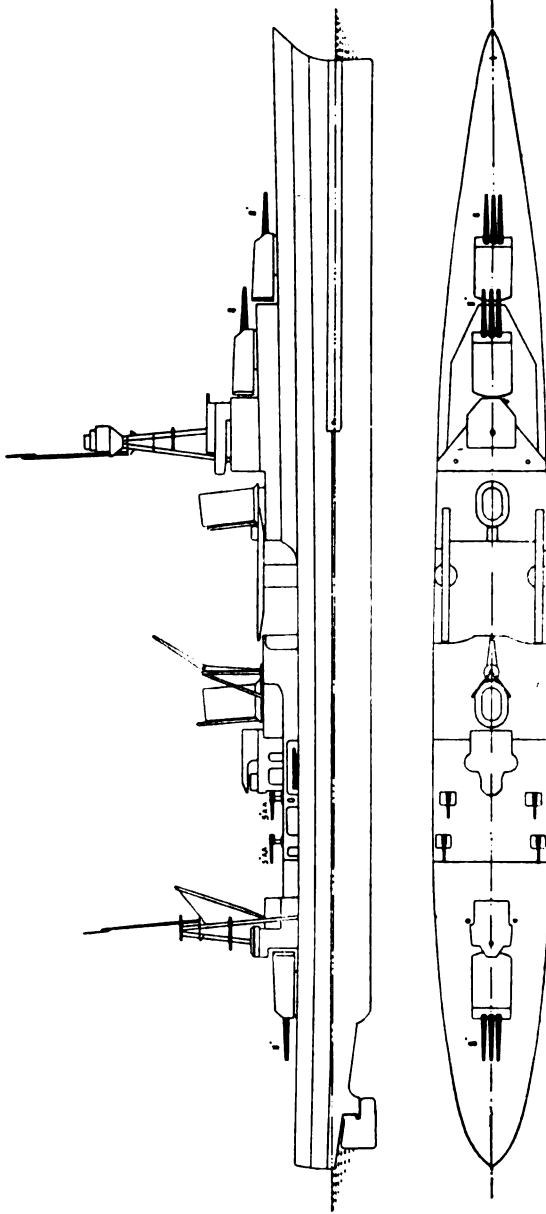


Length (on W.L.), 761 ft.; 19,900 tons; Speed, 24 knots; Enterprise and Yorktown completed 1938.
Armament, 8—6-in. A.A.; 16 1.1 in. M.A.A.; 76 aircraft; 1 catapult.

UNITED STATES.

CRUISERS.

Northampton. Chester. Louisville. ("Chester" Class.) Chicago. Houston. Augusta. ("Augusta" Class.)



"Chester" and "Augusta" Classes: Length (extreme), 600 ft.; 9,050-9,300 tons; Speed, 32-5 knots; Completed, 1930-31. Armament, 9-8-in.; 4-5-in. A.A.; 2-3-pr.; 8 in.; 2 triple 21-in. torpedo tubes; 2 catapults; 4-6 seaplanes. Correction to plan.—Fore topmast shortened.

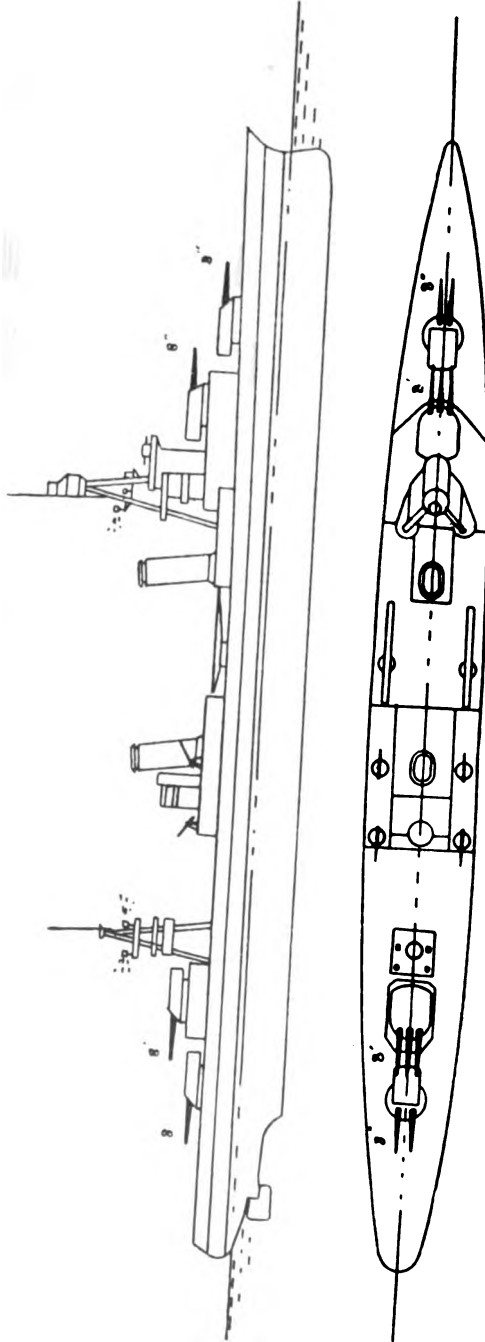
UNITED STATES.

CRUISERS,

"Pensacola" Class.

Salt Lake City.

Pensacola.



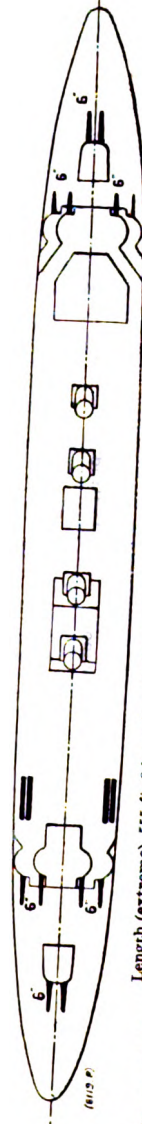
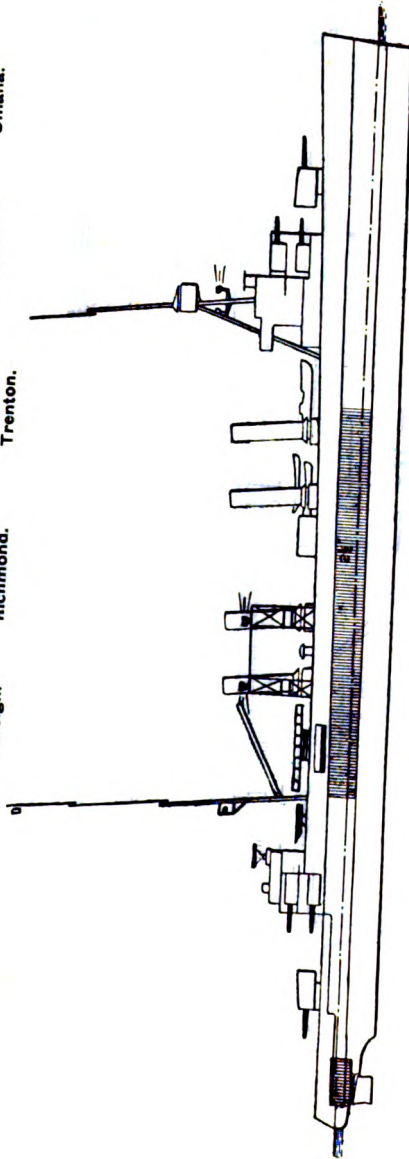
Length (extreme), 585, ft. ; 9,100 tons : Speed, 32.7 knots ; Completed, 1930.
Armament, 10—8-in. ; 4—6-in. A.A. ; 2—3-pr. : 8 M. ; 2 triple 21-in. torpedo tubes ;
Corrections to plan.—Crane fitted on fore side of after funnel and derricks fitted on after side.

UNITED STATES.

SCOUT CRUISERS.

"Omaha" Class.

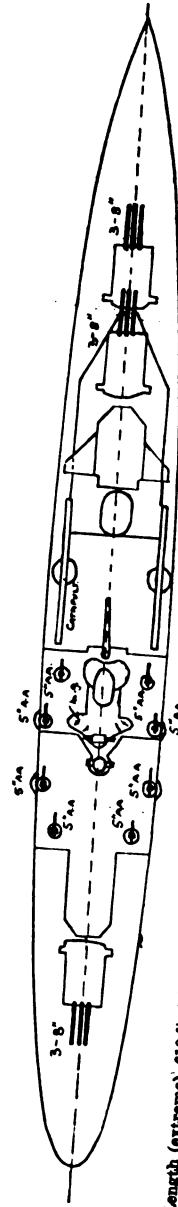
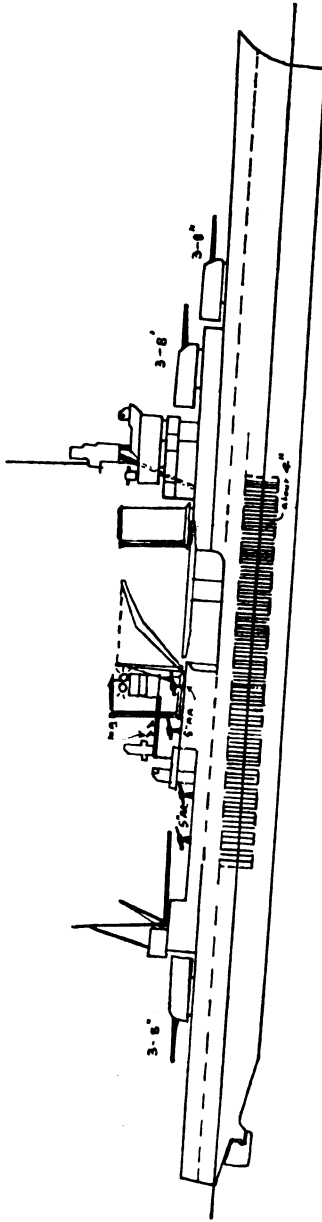
Cincinnati.	Concord.	Detroit.	Marblehead.	Memphis.	Milwaukee.	Omaha.
		Raleigh.	Richmond.	Trenton.		



Length (extreme), 555 ft. 6 ins.; Length W.L., 550 ft.; Speed, 33.7 knots; 7,050 tons; Completed in 1923-25
 Armament, 12-6-in. (Marblehead, 11-6-in.; Cincinnati, Detroit, Raleigh and Richmond, 10-6-in.); 4-8-in. A.A.; 2-3-pr.; 2 triple above-water
 Corrections to plan.—The pair of single 6-in. guns at upper deck level aft are removed in Marblehead, Cincinnati, Detroit, Raleigh and Richmond.
 In Marblehead there is a single gun on top of the after battery. Topgallant masts removed and topmasts shortened.
 Foremast head in Marblehead fitted with machine guns.

UNITED STATES.
CRUISERS.

Indianapolis. Portland.

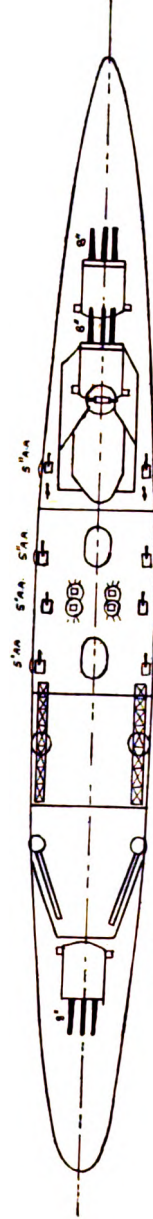
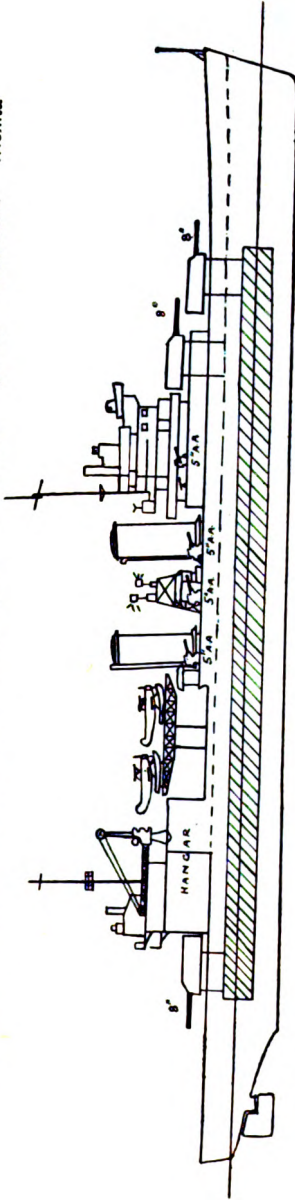


Length (extreme), 410 ft. 8 ins.; Indianapolis, 584 ft. on W.L.; Portland, 582 ft. on W.L.; Indianapolis, 9,950 tons; Portland, 9,800 tons; Speed, 22.7 knots. Completed, 1893-1898. Armament, 9-8-in., 8-6-in. A.A.; 10 machine guns; 2 catapults; 4-6 aircraft; 2-8-pdr.; 6-21 in. torpedo tubes. Corrections to plan.—Fore topmast is raked. Foremost funnel lengthened.

UNITED STATES.
CRUISERS.

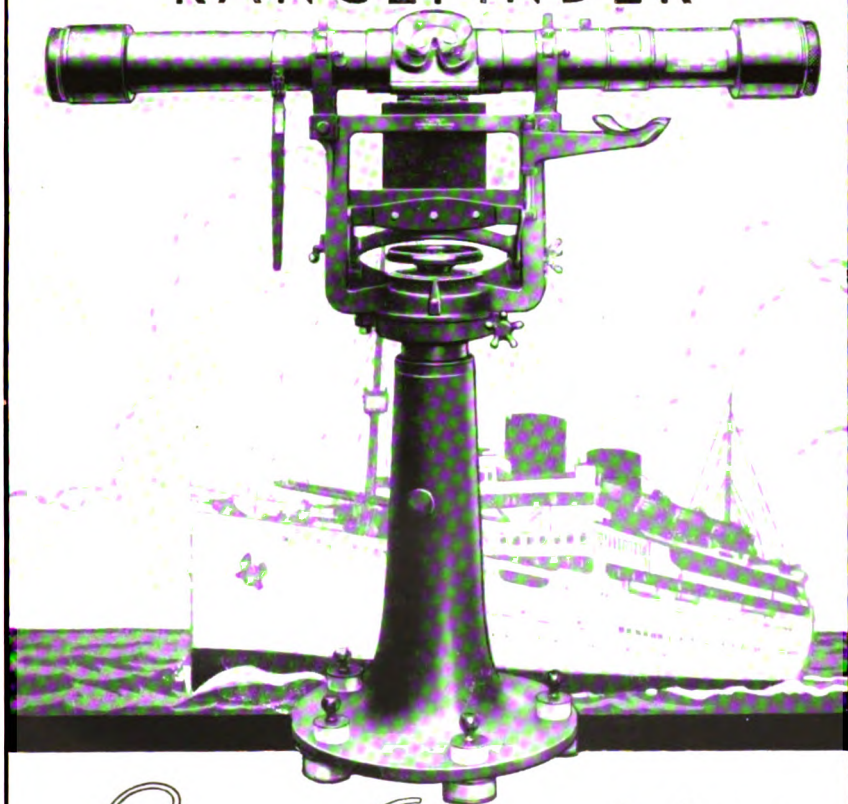
"Astoria" Class.

Astoria. New Orleans. San Francisco. Minneapolis. Tuscaloosa. Quincy. Vincennes. Wichita



Length (extreme), 588 ft.; on W. L., 574 ft.; 9,950 tons; Speed, 32.7 knots; Completed, 1934-36.
Armament, 9-8-in., 8-5-in., 2-3-pr., 10 smaller; 2 catapults; 4 aircraft.
Forward funnel fitted with clinker screen.

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accept civilian orders during
the war.

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a.a.cr. anti-aircraft cruiser; *a.cr.* armoured cruiser; *a.g.* armoured gunboat; *air.c.* aircraft carrier; *air.cr.* aircraft cruiser; *air.t.* aircraft tender; *a.s.* armoured ship; *a.t.* aviation transport; *b.* battleship; *b.cr.* battle cruiser; *c.d.* coast defence ship; *c.* cruiser; *cr.m.l.* cruiser minelayer; *d.* destroyer; *f.c.l.d.* first-class destroyer; *f.c.l.t.b.* first-class torpedo-boat; *f.l.* flotilla leader; *l.cr.* light cruiser; *m.l. & t.s.* minelaying and training ship; *s.c.l.d.* second-class destroyer; *s.cr.* scout cruiser; *sea-p.c.* seaplane carrier; *tr.cr.* training cruiser.

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